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DEPRESSION IN THE POPULATION: ASSESSMENT, PREVALENCE AND RELATIONSHIPS WITH SOCIO-DEMOGRAPHIC FACTORS AND COGNITIVE ASPECT OF SOCIAL ADJUSTMENT

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CONTENTS

LIST OF ORIGINAL PUBLICATIONS

The dissertation is based on the following original publications which will be referred to in the text by their respective Roman numerals.

I. **Aluoja, A.**, Shlik, J., Vasar, V., Luuk, K., & Leinsalu, M. (1999). Development and psychometric properties of the Emotional State Questionnaire, a self-report questionnaire for depression and anxiety. *Nordic Journal of Psychiatry, 53*, 443-449.

II. Pakriev, S., Vasar, V., **Aluoja, A.**, Saarma, M., & Shlik, J. (1997). Screening for depression in the rural population in Udmurtia. *Nordic Journal of Psychiatry, 51,* 325–330.

III. Pakriev, S., Vasar, V., **Aluoja, A.**, Saarma, M., & Shlik, J. (1998). Prevalence of mood disorders in the rural population of Udmurtia. *Acta Psychiatrica Scandinavica, 97,* 169–174.

IV. **Aluoja, A.**, Leinsalu, M., Shlik, J., Vasar, V., & Luuk, K. (2002). Symptoms of depression in the Estonian population: prevalence, sociodemographic correlates and social adjustment. *Journal of Affective Disorders, in press.*

INTRODUCTION

Depression is a concept denoting a wide range of phenomena starting with normal emotional reactions to loss and ending with medically significant mood disorders. In this study the term *depression* refers to a depressive episode as defined in the tenth revision of the *Classification of Mental and Behavioural Disorders* (ICD-10; World Health Organization, 1992) or clinically significant symptoms of the episode.

Mood disorders, especially depression, are among the most frequent mental disorders in the general population across the world (Kessler et al., 1994; Lépine, Gastpar, Mendlewicz, & Tylee, 1997). The high prevalence, chronicity, subjective suffering and associated impairment make depression one of the most important health problems of today. The Global Burden of Disease study has shown that major depression was the fourth most important cause of disability and premature death in the world and probably its impact on objective functioning and subjective well-being is on the increase (Murray & Lopez, 1997).

Despite the number of studies of depression in the population there is no consensus on the prevalence and risk factors of the disorder. Although highly prevalent, depression is still underdiagnosed. The use of standardized diagnostic interviews has increased the precision of diagnostics. At the same time the fully structured interviews are too time-consuming to be used in everyday practice. Therefore, the development of new instruments having an adequate balance between diagnostic validity and ease of administration is continuing, and for the same reason screening questionnaires for identification of possible cases are popular.

Depressed subjects have shown marked short-term and long-term impairment in social functioning (Ormel et al., 1994; Paykel & Weissman, 1973; Thornicroft & Sartorius, 1993). There is no consensus yet what is the role of objective circumstances and subjective appraisal in depression-related impairments, but more attention has been paid to the cognitive component of functioning lately (Prince & Prince, 2001). During the last decade evidence accumulated that not only major depression but also minor depression and even symptoms of depression, which do not meet the diagnostic criteria of depressive disorder by severity or duration, are associated with considerable social dysfunction (Judd, Akiskal, & Paulus, 1997). Also, depressions of different degrees of severity have somewhat similar correlates (Kessler, Zhao, Blazer, & Swartz 1997). All this has increased interest in the so-called subthreshold depressions and renewed one of the major debates, whether a categorical or a dimensional approach would better explain the nature of mood disorders (Stefanis & Stefanis, 1999).

1. STATING THE PROBLEM

Estonia can be considered a good model for studying the correlates of depression in the population because of its social and economical diversity in the 1990s. The studies in this dissertation were initiated to address some of the disputed questions mentioned above. The dissertation integrates results from two larger research projects. Studies **I** and **IV** are part of the Estonian Health Interview Survey (EHIS) carried out in 1996–1997 (Leinsalu, Grintšak, Noorkõiv, & Silver, 1998). EHIS was a population survey of health, health-related behaviours, and background factors encompassing a representative sample of Estonian population (N=4,711) at age 15–79. The second part of the dissertation comes from the research project on prevalence of mental disorders carried out in rural Udmurtia under the general guidance of Sergei Pakriev (Studies **II** and **III**).

Specifically the dissertation addresses the following issues:

- Possibilities of assessment of depressive symptoms with self-rate measures (Studies **I** and **II**);
- The prevalence of depressive symptoms in the Estonian population (Study **IV**);
- Socio-demographic and economic factors related to the prevalence of depressive symptoms and depressive disorder (Studies **III** and **IV**);
- Relationship of depression with cognitive aspects of social adjustment: the role of satisfaction and control (Studies **III** and **IV**).

2. ASSESSMENT OF DEPRESSION BY SELF-REPORT MEASURES

Self-report inventories of depressive symptoms have been widely used for the assessment of symptom severity, for screening in population studies and for detection of mood disorders in primary care. Despite the known prevalence of depression in the general population, it has been shown that this disorder is still inadequately recognized (Davidson & Meltzer-Brody, 1999; Lecrubier, Boyer, Lépine, & Weiller, 1996). Self-rating scales, which are easy to administer and demand minimal time and effort, could be valuable supplementary instruments in improving the detection of depressive disorders. Several instruments, such as Beck Depression Inventory (BDI), Hospital Anxiety and Depression Scale (HADS) and a 10-item Depression Scale (DEPS) have demonstrated satisfactory properties for screening in different populations (Bjelland, Dahl, Haug, & Neckelmann, 2002; Clarke, Smith, & Herrman, 1993; Salokangas, Poutanen, & Stengard, 1995). Study **II** confirmed that a short and simple screening questionnaire DEPS, which was primarily developed for the detection of possible depression in primary care (Salokangas et al., 1995), performs equally well in the general population in a different cultural context.

To improve the case-detecting properties of the questionnaires, use of items from the existing classification systems and scoring procedures resembling DSM algorithmic approach has been suggested (Zimmermann & Coryell, 1987; see also Sheeran & Zimmermann, 2002). At the same time, Sheeran and Zimmermann (2002) showed that the simple cut-off score approach performed as well as more complicated scoring methods. So, we maintained the cut-off approach as a simpler procedure in designing a new screening questionnaire for depression and anxiety, the Emotional State Questionnaire (EST-Q). Study **I** describes the development and psychometric properties of the new instrument. The EST-Q items were constructed according to the diagnostic criteria of depressive and anxiety disorders of the two major classification systems — ICD-10 and DSM-IV. The subscales were based more on the results of factor analysis than on the existing distinction between the disorders. Also, some common problems in self-rate measures for depression were addressed while developing the EST-Q, such as separating depression from anxiety and the continuity of depressive phenomena.

2.1. Differentiating between depression and anxiety

Depression and anxiety are highly overlapping conditions. The mood states of depression and anxiety share a considerable common component (Clark & Watson, 1991; Steer, Clark, Beck, & Ranieri, 1998). Also, depressive and anxiety disorders have been found to have a high comorbidity (Kessler et al., 1996). It has even been disputed whether depression and anxiety constitute separate phenomena or are different facets of the same general negative mood (see Feldman, 1993; Stavrakaki & Vargo, 1986). Besides being of major theoretical interest, the overlap between anxiety and depression constitutes difficulties in discriminating these conditions by means of questionnaires. The issue whether it is at all possible to discriminate anxiety and depression by self-rate measures is still controversial (Feldman, 1993; Wetzler & Katz, 1989). As a consequence, hierarchical models have emerged (Clark & Watson, 1991; Zinbarg & Barlow, 1996).

Clark and Watson's (1991) tripartite model of anxiety and depression proposes that these conditions have a common factor of negative affect (a general distress factor) and specific factors of physiological arousal for anxiety and absence of positive affect for depression. In developing the EST-Q for simultaneous assessment of symptoms of depression and anxiety we tried to ascertain specific and non-specific constituents of these conditions (Study **I**). We omitted the somatic symptoms of anxiety, though. Similar somatic symptoms are common in many medical disorders and their inclusion in a rating scale may cause difficulties in using the instrument with medically ill persons or elderly subjects. To overcome this difficulty, it is advisable to exclude somatic symptoms and use only cognitive and affective symptoms as was done, for instance in designing HADS (Zigmond & Snaith, 1983) and also the new BDI version for general practice (Beck, Guth, Steer, & Bal, 1997). A factor analysis yielded three disorder-specific and two non-specific factors. The emergence of distinctive depression, general anxiety and panic-agoraphobia factors suggests that at least on the symptom level depression and anxiety have specific features, and, though correlated, they constitute separate symptom dimensions. The respective subscales also differentiated patients with a depressive episode and a generalized anxiety disorder. The obtained depression factor corresponded closely with the low positive affect proposed to be the core of depression. The anxiety factor combined hyperarousal symptoms and an affective experience of anxiety. The non-specific factors of fatigue and insomnia in Study **I** differed somewhat from the general distress factor suggested by previous research (Clark & Watson, 1991; Lovibond & Lovibond, 1995).

In summary, Study **I** supported the idea of common and specific factors in anxiety and depression, although the exact nature of the factors differs partly from other studies. Also, our findings suggest that anxiety and depression could

be better discriminated by a self-rate instrument if it contains specific and common components in separate subscales.

2.2. Clinical depression and depressiveness in the general population: analogous or different phenomena?

Another problem in using self-rate questionnaires is whether thus identified depressiveness (referred to as *analogue depression*) is similar to clinical depression. A related question is how justifiable are conclusions made about the experience and risk factors of depression using only self-rate measures. No consensus in comparing analogue and clinical depression by structure and correlates has been reached as yet. Coyne (1994) suggested that self-reported distress was qualitatively distinct from a major depressive episode. At the same time Cox, Enns, Borger and Parker (1999) demonstrated that analogue (identified by BDI) and clinical depression had a similar symptom structure. The differences between the samples had a quantitative and not qualitative nature. To test the similarity between the depressive experience of subjects identified with the EST-Q Depression subscale and clinically diagnosed depressives, we reanalysed the patient and population data (see Studies **I** and **IV** for details of the subjects). We compared the structure of specific and non-specific depressive symptoms in clinically depressed patients (N=123) and analogue-depressed sample identified by the EST-Q Depression subscale (N=579). Table 1 presents the mean values for both groups of the items of the EST-Q Depression, Fatigue, and Insomnia subscales. In both groups the highest mean ratings were observed for the same items: item 1. *Feelings of sadness*; item 4. *Fatigue or loss of energy* and item 17. *Hopelessness about the future*.

To test the similarity of the EST-Q item structure in both group, we examined the equality of the covariance matrices using the path analysis. Similarly to Cox et al. (1999, we used several noncentrality-based goodness-of-fit indices. The criteria for equivalence were a Steiger-Lind RMSEA index less than 0.10, a population gamma index (PGI) higher than 0.95 and an adjusted population index (APGI) higher than 0.95. Our data yielded the RMSEA=0.052, PGI=0.977 and APGI=0.954, which indicates that the patterns of symptoms were similar in the clinical and analogue groups.

Table 1. Means and standard deviations for the clinical and analogue depressive groups

EST-Q item	Clinical group		Analogue group	
	Mean	SD	Mean	SD
1. Feelings of sadness	3.20	0.72	2.72	0.85
4. Fatigue or loss of energy	3.16	0.88	2.57	1.02
17. Hopelessness about the future	2.90	0.91	2.65	1.06
3. Feeling no interest or pleasure in things	2.79	1.05	2.23	1.04
11. Restless or disturbed sleep	2.76	1.14	2.26	1.19
8. Diminished ability to think or concentrate	2.71	0.97	1.78	1.11
18. Impossibility to enjoy things	2.68	1.00	1.99	1.12
19. Rest does not restore strength	2.67	1.08	1.61	1.25
21. Being easily fatigued	2.62	0.98	2.25	1.24
10. Difficulty falling asleep	2.58	1.22	1.99	1.36
16. Feeling lonely	2.53	1.15	2.11	1.25
6. Self-accusations	2.42	1.19	1.57	1.16
12. Waking up too early	2.31	1.34	1.84	1.40
5. Feelings of worthlessness	2.14	1.24	1.78	1.17
9. Feeling slowed down	1.96	1.19	1.86	1.45
7. Recurrent thoughts of death or suicide	1.23	1.14	0.78	1.06

This result is in accordance with the idea that the experience of depression lies on a continuum, and the less severe symptoms of depression found in the population are qualitatively similar to clinical depression. This has also been confirmed by research demonstrating that milder forms of depression (subsyndromal depression, minor depression) have similar structures, correlates and impairment than major depression (Kessler et al., 1997; Maier, Gänsicke, & Weiffenbach, 1997; Rapaport & Judd, 1998).

3. PREVALENCE AND CORRELATES OF DEPRESSION

3.1. Prevalence of depressive disorders and depressive symptoms

Studies **III** and **IV** investigated the prevalence of depressive episode and depressive symptoms as well as related socio-demographic and economic factors in two different populations — Udmurtia and Estonia. The prevalence of depression varies widely across countries and also across studies (for reviews see Bland, 1997; Weissman et al., 1996). One reason is that prevalence rates of mental disorders are dependent on the study instruments and classification systems, but even studies conducted with the same methodology, in the same time frame and region yield different rates in different countries. For instance, a recent pan-European study (DEPRES) showed that the 6-month prevalence for major depression ranged from 3.8–9.9 across six countries (Lépine et al., 1997). The US Epidemiologic Catchment Area (ECA) Study (Regier et al., 1988) estimated the point prevalence of major depression to be only half of that found later in another US population study, the National Comorbidity Survey (NCS). The NCS, which used the Composite International Diagnostic Interview (CIDI), yielded the current major depression rate of 4.9%. (Blazer, Kessler, McGonagle, & Swartz, 1994). In this respect the Udmurtia study is a real outlier showing the prevalence for current DSM-III-R mood disorder of 19.5 (Study **III**). That result can not be explained by differences in research methodology because, similarly to the National Comorbidity Survey, our study used the fully-structured CIDI interview. Probably the main reasons lie in cultural differences and different risk factors as proposed by other cross-national epidemiologic studies. (Lépine et al., 1997; Weissman et al., 1996). One important factor could be socio-economic deprivation of the Udmurtian rural areas. It has been shown that in the population the prevalence of depression correlates with the area deprivation (Eachus et al., 1996)

To the best of our knowledge, in Estonia no population studies of mental disorders using structured psychiatric interviews and encompassing a representative population sample have been conducted so far. Study **IV** estimates that the point prevalence of depressive symptoms in Estonian population is 11.1% (6.7% in men and 14.9% in women). The symptoms were assessed by the EST-Q, which is a self-rate instrument that probably detects not only major depression but also minor depression and subthreshold depressive symptoms of considerable severity. Thus obtained prevalence of depressiveness is a very rough estimate of depressive disorders in Estonia and could not be directly compared to results from studies using structured psychiatric interviews. Still, it is interesting to note that the later analysis of the Epidemiologic Catchment Area data showed the combined point prevalence for major depression, minor

depression, dysthymia, and subsyndromal depressive symptoms to be 10 percent (Judd et al., 1997), which is very close to our results.

3.2. Depression against the background of socio-demographic and economic factors

The prevalence of depression is significantly related to demographic, social, and economic risk factors. Studies of correlates of depression have yielded varying results, but the most consistently identified factors have been female sex, being divorced or widowed, and some indices of a low socio-economic status. Our studies showed a similar female to male ratio of approximately 2:1 in depressive disorders in Udmurtia (Study **III**) and depressive symptoms in Estonia (Study **IV**). Most other studies have also demonstrated the higher prevalence of depressive disorders in women with approximately the same ratio (Andrews, Henderson, & Hall, 2001; Blazer et al., 1994, Weissman et al., 1996). However, inconsistent results have been obtained in minor depression and depressive symptoms (Lépine et al, 1997; Salokangas & Poutanen, 1998). Relationship between depressiveness and a lack of marital relationship was not surprising (Andrews et al., 2001; Blazer et al., 1994; Salokangas & Poutanen, 1998), though there were some differences between Estonia and Udmurtia. While in Estonia more depressives were found in all groups of non-married subjects (Study **IV**), then in Udmurtia one could claim the same only for separated and divorced respondents, not for the never married subjects (Study **III**).

Depression has usually been found to correlate substantially with unemployment and moderately with a low income while relationships to education, ethnicity and age are controversial (Andrews et al., 2001; Blazer et al., 1994; Kessler et al., 1997; Murphy et al., 2000; Salokangas & Poutanen, 1998; Weissman et al., 1996). Study **IV** demonstrated a strong relationship between depressiveness and average household income, being unemployed, or not working for some other reasons, mainly because of retirement. This supports the findings that financial strain is a major risk factor for depression (Weich & Lewis, 1998). While our study showed a close relationship between depression and economic factors, the other population studies have found a higher depression rate only in the lowest income group or no relationship to income at all (Blazer, et al., 1994; Isometsä, Aro, & Aro, 1997; Kessler et al., 1994; Lin & Parikh, 1999). One possible reason could be that Estonia has greater economic inequality and a lower income level compared to North America and Western European countries, which makes the associations with depression more clear. The marked income inequality of Estonia indicated by the GINI index is really true compared to Western Europe and Canada but not to the USA (see http://www.wider.unu.edu/wiid/wwwiid.htm, retrieved 31.07.02). The inter-

action between the income level and inequality indices in relationship to mental disorders has also been suggested by Weich, Lewis, and Jenkins (2001). The homogeneity of income (low income of the majority) in the Udmurt rural population could also be the reason why we found no relationship between depression and income in Study **III**. Education and occupation type are also frequent indicators of the socio-economic status. Although more depressive subjects were observed in groups with a lower educational level and in occupation types with less responsibility and skills, these differences appeared non-significant and were mainly explained by income and employment status (Study **IV**).

There is no consensus whether the rate of depression is related to race or ethnicity. The ECA and the NCS showed some racial differences in lifetime prevalence but not in point prevalence when all the other socio-demographic factors were accounted for (Blazer et al., 1994; Kessler et al., 1994; Regier et al., 1993). We did not find any relationship between depressive disorders and ethnicity in Udmurtia (Study **III**). However in Estonia we did found a higher score of depressiveness in ethnic groups other than Estonians (Study **IV**). This relationship was pronounced and remained the same after controlling for other demographic and economic factors. Therefore, it could not be considered the result of social and economic differences between the ethnic groups. We can only speculate that non-Estonians were exposed to additional stressors and greater uncertainty than Estonians during the transition in the 1990s. We may also suggest that it is not ethnicity but nativity that makes the difference. Most of the non-Estonians were also non-natives, that is, they belonged to the first or second generation born outside Estonia. The EHIS data showed that 91.5% of Russians and 96.5% of other ethnic groups were non-native. This reasoning is supported by data that immigrants, even second-generation immigrants, were at a higher risk for mental disorders compared to both origin and host populations (Carta et al., 2002; Silveira, Skoog, Sundh, Allebeck, & Steen, 2002).

Contrary to studies indicating a lower rate of depressive disorders in older age groups (Blazer et al., 1994; Isometsä et al., 1997; Murphy et al., 2000), we found a considerably higher depression rate in older age. There may be several reasons for that. In the oldest age groups part of the higher depressiveness can be explained by economic factors, but the relationship remains partly independent. It seems more probable that major depression and depressive symptoms bear different relationships to age. In previous research depressive symptoms revealed a positive association with age in primary care patients as well as in the general population (Lépine et al., 1997; Salokangas & Poutanen, 1998). Beekman, Copeland, and Prince (1999) in their review article also concluded that major depression is relatively rare among the elderly while minor depression and depressive symptoms are common in later life. It has also been suggested that increased depressiveness with age could be the effect of some other risk factors, especially poor physical health (Roberts, Kaplan, Shema, & Strawbridge, 1997). As health ratings in Estonia are low in older age

groups (Leinsalu, Grintšak, & Noorkõiv, 1999), it may be another explanation for our results. This is supported by Saks et al. (2001) reporting that, compared to other European countries, the elderly in Estonia have a higher prevalence of some chronic somatic diseases as well as depressive symptoms.

In conclusion, depressive symptoms of considerable severity have a high prevalence in the Estonian population. Depressiveness bears a strong relationship with demographic and economic factors; it has a similar pattern but greater magnitude than found in other population studies.

4. DEPRESSION AND SOCIAL ADJUSTMENT

Study **IV** addresses some questions of social adjustment related to depressive symptoms. The interest in the social context and consequences of mental disorders has motivated the research of depression-related social adjustment or social functioning (these terms are used interchangeably). Studies have shown that when patients recover from depression, the core symptoms of the disorder might behave differently from the associated social dysfunction. Poor social adjustment may persist long after the resolution of the typical symptoms, increasing the risk of earlier recurrences (Coryell, Endicott, & Keller, 1990; Paykel & Weissman, 1973; Staner et al., 1997). The interest in social adjustment has been renewed by the findings that antidepressants, which have a comparable effect on symptoms of depression, may differentially affect social functioning of the patients (Dubini, Bosc, & Polin, 1997; Souetre, Martin, Lozet & Monteban, 1996).

Though widely used in describing motivational and functional impairment in depression, there is no consensus concerning the definition of social adjustment or social functioning (for reviews see Hirschfeld et al., 2000; Weissman, 2000). There is a considerable overlap with quality of life issues, and if self-report procedures are used, these phenomena seem to be practically the same (Healy & Healy, 1998; Weissman, 2000). Figure1 presents one attempt to delineate these concepts.

Usually social adjustment denotes the ability of an individual to fulfil normal social roles, which is also considered the core of quality of life. Objective adjustment includes functioning at work and in studies, organizing everyday life and leisure, managing finances, performing as a family member, creating and maintaining relationships. 'Objective' here means performance and conditions that can be objectively assessed, that is, being employed, level of income, lost workdays, and quantity of relationships. Subjective adjustment denotes satisfaction, enjoyment, and interest that people have in their role performance and relationships, which overlaps with the affective and cognitive components of quality of life (Prince & Prince, 2001). Satisfaction is a frequently used indicator of subjective functioning (Frisch, Cornell, Villanueva & Retzlaff, 1992). Recent studies have added ideas from cognitive and interpersonal theories of depression stressing the role of relationships and sense of control in social adjustment (Bosc, Dubini, & Polin, 1997). This is a logical sequel to studies showing that different health problems including depression are related to low self-efficacy, low sense of control, and pessimistic attitudes (Abramson, Metalsky, & Alloy 1989; Beck, 1976; Lachman & Weaver, 1998; Seligman, 1975; Waikar & Craske, 1997). Study **IV** addressed two cognitive components of subjective adjustment, namely satisfaction and control.

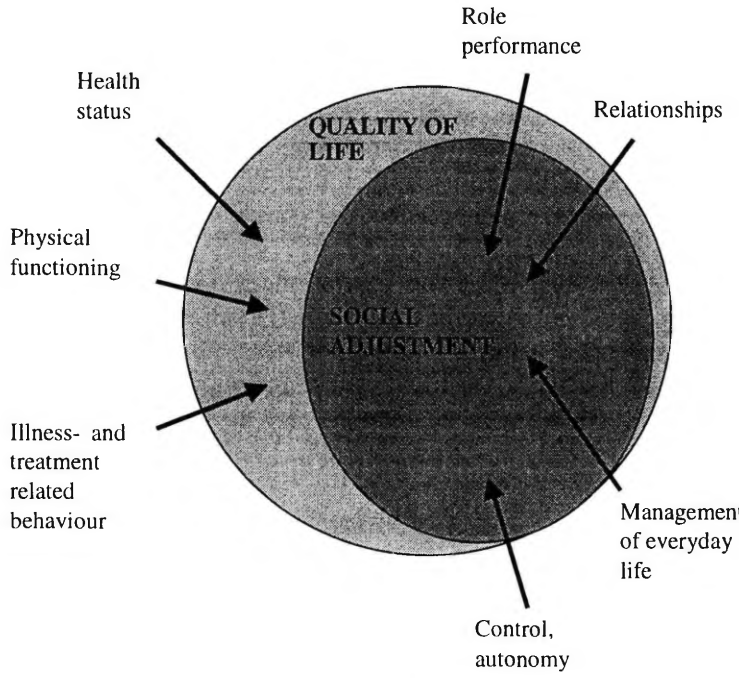

Figure 1. Concepts of quality of life and social adjustment

4.1. Satisfaction and perception of future

Satisfaction is the cognitive part of the broader construct of well-being. Low satisfaction with one's life has been found in the case of several mental disorders but especially in depression (Cavaglia, Matos-Pires, Botelho, Oliveira, & Arriaga, 1999; Koivumaa-Honkanen et al, 1996; Livingston, Watkin, Milne, Manela, & Katona, 1997; Ritsner et al., 2000). Study **IV** confirmed that, compared to non-depressives depressive subjects were significantly less satisfied with the main spheres of life, such as work, career, economic situation, family life, leisure and life in general. The same applied to trusting relationships as a whole and relationships with a partner. Depressive subjects showed the lowest satisfaction with economic circumstances, but the same occurred in non-depressive subjects. The most pronounced differences in satisfaction between depressed and non-depressed respondents were observed in family life and life in general. Similarly, the Udmurtia study showed a strong relationship between depressive disorders and dissatisfaction with one's family relationships (Study **III**). The discord in family and marital relationships appears to be universally related to depression (Fredman, Weissman, Leaf, & Bruce, 1988; Merikangas,

Prusoff, Kupfer, & Frank, 1985; Salokangas & Poutanen, 1998; Zlotnick, Kohn, Keitner, & Della Grotta, 2000). The relative importance of family relationships was also demonstrated by a finding that subjects who reported having trusting relationships both inside and outside the family, and even those whose relationships were limited only to one's family, had significantly lower rates of depressive symptoms than those with trusting relationships only outside their families (Study **IV**).

If depression is related to adverse socio-economic circumstances, as confirmed by Studies **III** and **IV**, then it can be argued that dissatisfaction is more related to these factors and not to the depression itself. Study **IV** confirmed that depression has an independent relationship to dissatisfaction, that is, depressed subjects are less satisfied despite their real life circumstances. This supports the results of Koivumaa-Honkanen et al (1999) that subjects with depressive disorders underestimate objective circumstances. This is in accordance with the cognitive theory proposed by Beck (1976) that depression is related to negative thought patterns, which form the core of the disorder. Negative distorted cognitions about the world, oneself and future are characteristic of depression, probably maintaining the disorder. Beck's views are supported also the finding that depressive subjects have a more pessimistic prognosis about the future (Study **IV**). The difference between depressives and non-depressives was moderate, but considering that most items were about general developments in society and only one item concerned personal future, it is still noteworthy.

4.2. Control and depression

Though sense of control over environment has been included as an indicator of social adjustment (Bosc et al., 1997), the concept itself is much more comprehensive encompassing phenomena from innate needs to beliefs acquired through experience. A review article by Haidt & Rodin (1999) provides a thorough taxonomy of control constructs. In Study **IV** we proceed from the cognitive perspective and by control denote the generalized belief of exerting influence over one's life.

A low sense of control has been considered an antecedent factor for mental and physical health problems (Rodin & Salovey, 1989). Seligman (1975) in his learned helplessness theory related depressive phenomena to the experience of uncontrollability. A combination of hopelessness and uncontrollability has been regarded as the major cognitive correlate of depressive symptoms (Abramson et al., 1989). A low sense of control was the strongest predictor of depressive symptoms found in Study **IV**. This is in line with the results stressing the role of low perceived control in depression either as an independent factor or a

mediator of socio-economic circumstances and social support. The whole spectrum of depressive phenomena has been related to external control, low self-efficacy, low perceived control, and helplessness (Johnson & Sarason, 1978; Maciejewski, Prigerson, & Mazure, 2000; McCullough et al., 1994; Ross & Mirowski, 1989; Waikar & Craske, 1997). All these phenomena belong to the spectrum of control constructs. It must be noted that our Study **IV** used a very short and simple measure of control. Thus, we could not differentiate between general and situation-specific sense of control. Also, we could not address the reformulated helplessness theory stating that depression is related to a combination of helplessness and a specific attributional style of making internal, stable, and global attributions of negative events (Abramson, Seligman, & Teasdale, 1978). Nevertheless even this crude measure identified a strong inverse relationship between control and depressiveness, which similarly to satisfaction has an independent significance.

Our results suggest a vicious circle of cognitions and behaviour that is maintaining depression. If dissatisfaction with one's life is combined with negative beliefs about control and less hope of anything changing to the better, it may lead to low activity and fewer attempts to change the situation. Low activity in its turn lessens the chances of favourable changes in life circumstances, confirming negative cognitions and helplessness, thus maintaining depression. Similar kinds of cognitive-motivational-emotional cycles have been proposed by several authors (Lewinsohn, 1974; Kanfer & Hagerman, 1981).

CONCLUSIONS

1. Depressive disorders can be successfully screened by self-rate questionnaires (Studies **I, II**).
2. Symptoms of depression and anxiety consist of a general non-specific component and specific components (Study **I**).
3. Discriminative validity of self-rate questionnaires could be increased by multidimensional instruments having disorder-specific and no-specific symptoms in separate subscales (Study **I**).
4. Depression in the population, identified by self-rate measures has a similar structure than in clinically depressed subjects. This supports the continuity hypothesis, namely that subclinical symptoms of depression and varieties of depressive disorders form a continuous spectrum of depression (Study **I**).
5. The estimated point prevalence of depressive symptoms (comparable in severity to major depression) in the Estonian population amounts to 11.1%. Depressive symptoms are twice as common in women than in men. (Study **IV**).
6. The prevalence of depressive symptoms in the population is related to socio-demographic and economic conditions. Different populations can have slightly different correlates. Some correlates like sex, unemployment, and being divorced or widowed seem to be universal for both depressive disorders and depressive symptoms and do not depend on the type of population. Other correlates are more population-specific like ethnicity, the precise nature of economical factors and education (Studies **III, IV**).
7. Depression is related to a low degree of satisfaction with most spheres of life. The relationship can not be explained by objective life circumstances (Study **IV**).
8. Depression shows a strong inverse relationship to the general belief in having control over one's personal life (Study **IV**).

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REFERENCES

Abramson, L.Y., Metalsky, G.I., & Alloy, L.B. (1989). The hopelessness theory of depression: a theory-based subtype of depression. *Psychological Review, 96,* 358–372.

Abramson, L.Y., Seligman, M.E.P., & Teasdale, J.D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87,* 49–74.

Andrews, G., Henderson, S., & Hall, W. (2001). Prevalence, comorbidity, disability and service utilisation. Overview of the Australian National Mental Health Survey. *British Journal of Psychiatry, 178,* 145–153.

Beck, A.T. (1976). *Cognitive therapy and the emotional disorders.* New York: International Universities Press.

Beck, A.T., Guth, D., Steer, R.A., & Ball, R. (1997). Screening for major depression disorders in medical inpatients with the Beck Depression Inventory for Primary Care. *Behaviour Research and Therapy, 35,* 785–791.

Beekman, A.T.F., Copeland, J.R.M., & Prince, M.J. (1999). Review of community prevalence of depression in later life. *British Journal of Psychiatry, 174,* 307–311.

Bjelland, I., Dahl, A.A., Haug, T.T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *Journal of Psychosomatic Research, 52,* 69–77.

Bland, R.C. (1997). Epidemiology of affective disorders: a review. *Canadian Journal of Psychiatry, 42,* 367–377.

Blazer, D.G., Kessler, R.C., McGonagle, K.A., & Swartz, M.S. (1994). The prevalence and distribution of major depression in a national community sample: the National Comorbidity Survey. *American Journal of Psychiatry, 151,* 979–986.

Bosc, M., Dubini, A., & Polin, V. (1997). Development and validation of a social functioning scale, the Social Adaptation Self-evaluation Scale. *European Neuropsychopharmacology, 7* (Suppl.1), S57–S70.

Carta, M.G., Kovess, V., Hardoy, M.C., Morosini, P., Murgia, S., & Carpiniello, B. (2002). Psychiatric disorders in Sardinian immigrants to Paris: a comparison with Parisians. *Social Psychiatry and Psychiatric Epidemiology, 37,* 112–117.

Cavaglia, F., Matos-Pires, A., Botelho, M., Oliveira, M., & Arriaga, F. (1997). The quality of life in dysthymic and major depressive disorders. *Biological Psychiatry, 42* (Suppl. 1), 256S.

Clark, L.A., & Watson, D. (1991). Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100,* 316–336.

Clarke, D.M., Smith, G.C., & Herrman, H.E. (1993). A comparative study of screening instruments for mental disorders in general hospital patients. *International Journal of Psychiatry in Medicine, 23,* 323–337.

Coryell, W., Endicott, J., & Keller, M. (1990). Outcome of patients with chronic affective disorder. *American Journal of Psychiatry, 147,* 1627–1633.

Cox, B. J., Enns, M. W., Borger, S. C., & Parker, J. D. A. (1999). The nature of the depressive experience in analogue and clinically depressed samples. *Behaviour Research and Therapy, 37,* 15–24.

Coyne, J.C. (1994). Self-reported distress: analogue or ersatz depression? *Psychological Bulletin, 116,* 29–45.

Davidson, J.R.T., & Meltzer-Brody, S.E. (1999). The underrecognition and undertreatment of depression: What is the breadth and depth of the problem? *Journal of Clinical Psychiatry, 60* (Suppl. 7), 4–9.

Dubini, A., Bosc, M., & Polin, V. (1997). Noradrenaline-selective versus serotonin-selective antidepressant therapy: differential effects on social functioning. *Journal of Psychopharmacology, 11* (Suppl. 4), S17–S23.

Eachus, J., Williams, M., Chan, P., Smith, G.D., Grainge, M., Donovan, J., & Frankel, S. (1996). Deprivation and cause specific morbidity: evidence from the Somerset and Avon survey of health. *British Medical Journal, 312,* 287–292.

Feldman, L.A. (1993). Distinguishing depression and anxiety in self-report: evidence from confirmatory factor analysis on nonclinical and clinical samples. *Journal of Consulting and Clinical Psychology, 61,* 631–638.

Fredman, L., Weissman, M.M., Leaf, P.J., & Bruce, M.L. (1988). Social functioning in community residents with depression and other psychiatric disorders: results of the New Haven Epidemiologic Catchment Area Study. *Journal of Affective Disorders, 15,* 103–112.

Frisch, M.B., Cornell, J., Villanueva, M., & Retzlaff, P.J. (1992). Clinical validation of the Quality of Life Inventory: a measure of life satisfaction for use in treatment planning and outcome assessment. *Psychological Assessment, 4,* 92–101.

Haidt, J., & Rodin, J. (1999). Control and efficacy as interdisciplinary bridges. *Review of General Psychology, 3,* 317–337.

Hirschfeld, R.M., Montgomery, S.A., Keller, M.B., Kasper, S., Schatzberg, A.F., Moller, H.J., Healy, D., Baldwin, D., Humble, M., Versiani, M., Montenegro, R., & Bourgeois, M. (2000). Social functioning in depression: a review. *Journal of Clinical Psychiatry, 61,* 268–275.

Isometsä, E., Aro, S., & Aro, H. (1997). Depression in Finland: a computer assisted telephone interview study. *Acta Psychiatrica Scandinavica, 96,* 122–128.

Johnson, J.A., & Sarason, I.G. (1978). Life stress, depression and anxiety: internal-external control as a moderator variable. *Journal of Psychosomatic Research, 22,* 205–208.

Judd, L.L., Akiskal, H.S., & Paulus, M.P. (1997). The role and clinical significance of subsyndromal depressive symptoms (SSD) in unipolar major depressive disorder. *Journal of Affective Disorders, 45,* 5–18.

Kanfer, H.K., & Hagerman, S. (1981). The role of self-regulation. In L.P. Rehm (Ed.), *Behaviour therapy for depression. Present status and future directions* (pp. 143–179). New York: Academic Press.

Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen, H.U., & Kendler, K.S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives of General Psychiatry, 51,* 8–19.

Kessler, R.C., Nelson, C.B., McGonagle, K.A., Liu, J., Swartz, M., & Blazer, D. (1996). Comorbidity of DSM-III-R major depressive disorder in the general population: results from the US National Comorbidity Survey. *British Journal of Psychiatry, 168,* 17–30.

Kessler, R.C., Zhao, S., Blazer, D. G., & Swartz, M. (1997). Prevalence, correlates, and course of minor depression and major depression in the National Comorbidity Survey. *Journal of Affective Disorders, 45,* 19–30.

Koivumaa-Honkanen, H.T, Honkanen, R., Antikainen, R., Hintikka, J., & Viinamaki, H. (1999). Self-reported life satisfaction and treatment factors in patients with schizophrenia, major depression and anxiety disorder. *Acta Psychiatrica Scandinavica, 99,* 377–384.

Koivumaa-Honkanen, H.T., Viinamäki, H., Honkanen, R., Tanskanen, A., Antikainen, R., Niskanen, L., Jääskeläinen, J., & Lehtonen, J. (1996). Correlates of life satisfaction among psychiatric patients. *Acta Psychiatrica Scandinavica, 94,* 372–378.

Lecrubier, Y., Boyer, P., Lépine, J.-P., & Weiller, E. (1996). The identification of psychiatric disorders in primary care. *European Psychiatry, 11* (Suppl. 4), 178–179.

Leinsalu, M., Grintšak, M., & Noorkõiv, R. (1999). *Estonian health interview survey. Tables.* Tallinn: Institute of Experimental and Clinical Medicine.

Leinsalu, M., Grintšak, M., Noorkõiv, R., & Silver, B. (1998). *Estonian health interview survey. Methodological report.* Tallinn: Institute of Experimental and Clinical Medicine.

Lépine, J.P., Gastpar, M., Mendlewicz, J., & Tylee, A. (1997). Depression in the community: the first pan-European study DEPRES (Depression Research in European Society). *International Clinical Psychopharmacology, 12,* 19–29.

Lewinsohn, P.M., (1974). A behavioural approach to depression. In: R.J. Friedman, & M.M. Katz (Eds.), *The psychology of depression: Contemporary theory and research* (pp. 157–185). New York: Wiley.

Lin, E., & Parikh, S.V. (1999). Sociodemographic, clinical, and attitudinal characteristics of the untreated depressed in Ontario. *Journal of Affective Disorders, 53,* 153–162.

Livingston, G., Watkin, V., Milne, B., Manela, M. V., & Katona, K. (1997). The natural history of depression and the anxiety disorders in older people: the Islington community study. *Journal of Affective Disorders, 46,* 255–262.

Lovibond, P.F., & Lovibond, S.H. (1995). The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33,* 335–343.

Maciejewski, P.K., Prigerson, H.G., & Mazure, C.M. (2000). Self-efficacy as a mediator between stressful life events and depressive symptoms. Differences based on history of prior depression. *British Journal of Psychiatry, 176,* 373–378.

Maier, W., Gänsicke, M., & Weiffenbach, O. (1997). The relationship between major and subthreshold variants of unipolar depression. *Journal of Affective Disorders, 45,* 41–51.

McCullough, J.P., McCune, K.J., Kaye, A.L., Braith, J.A., Friend, R., Roberts, W.C., Belyea-Caldwell, S., Norris, S.L., & Hampton, C. (1994). Comparison of a community dysthymia sample at screening with a matched group of nondepressed community controls. *Journal of Nervous and Mental Disease, 182,* 402–407.

Merikangas, K.R., Prusoff, B.A., Kupfer, D.J., & Frank, E. (1985). Marital adjustment in major depression. *Journal of Affective Disorders, 9,* 5–11.

Murray, C.J.L., & Lopez, A.D. (1997). Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *Lancet, 349,* 1436–1442.

Murphy, J.M., Laird, N.M., Monson, R.R., Sobol, A.M., & Leighton, A.H. (2000). A 40-year perspective on the prevalence of depression: the Stirling County Study. *Archives of General Psychiatry, 57,* 209–215.

Ormel, J., VonKorff, M., Ustun, B., Pini, S., Korten, A., & Oldehinkel, T. (1994). Common mental disorders and disability across cultures. *Journal of the American Medical Association, 272,* 1741–1748.

Paykel, E.S., & Weissman, M.M. (1973). Social adjustment and depression. A longitudinal study. *Archives of General Psychiatry. 28,* 659–663.

Prince, P.N., & Prince, C.R. (2001). Subjective quality of life in the evaluation of programs for people with serious and persistent mental illness. *Clinical Psychology Review, 21,* 1005–1036.

Rapaport, M.H., & Judd, L.L. (1998). Minor depressive disorder and subsyndromal depressive symptoms: functional impairment and response to treatment. *Journal of Affective Disorders. 48,* 227–232.

Regier, D.A., Boyd, J.H., Burke, J.D. Jr., Rae, D.S., Myers, J.K, Kramer, M., Robins, L.N., George, L.K., Karno, M., & Locke, B.Z. (1988). One-month prevalence of mental disorders in the United States. Based on five Epidemiologic Catchment Area sites. *Archives of General Psychiatry, 45,* 977–986.

Regier, D.A., Farmer, M.E., Rae, D.S., Myers, J.K., Kramer, M., Robins, L.N., George, L.K., Karno, M., & Locke, B.Z. (1993). One-month prevalence of mental disorders in the United States and sociodemographic characteristics: the Epidemiologic Catchment Area study. *Acta Psychiatrica Scandinavica, 88,* 35–47.

Ritsner, M., Modai, I., Endicott, J., Rivkin, O., Nechamkin, Y., Barak, P., Goldin, V., & Ponizovsky, A. (2000). Differences in quality of life domains and psychopathologic and psychosocial factors in psychiatric patients. *Journal of Clinical Psychiatry, 61,* 880–889.

Roberts, R.E., Kaplan, G.A., Shema, S.J., & Strawbridge, W.J. (1997). Does growing old increase risk for depression. *American Journal of Psychiatry, 154,* 1384–1390.

Rodin, J., & Salovey, P., (1989). Health Psychology. *Annual Review of Psychology, 40,* 533–579.

Saks, K., Kolk, H., Allev, R., Soots, A. Kõiv, K., Paju, I., Jaanson, K., & Schneider, G. (2001). Health status of the older population in Estonia. *Croatian Medical Journal, 42,* 663–668.

Salokangas, R.K., & Poutanen, O. (1998). Risk factors for depression in primary care. Findings of the TADEP project. *Journal of Affective Disorders, 48,* 171–180.

Salokangas, R.K., Poutanen, O., & Stengard, E. (1995). Screening for depression in primary care. Development and validation of the Depression Scale, a screening instrument for depression. *Acta Psychiatrica Scandinavica, 92,*10–16.

Sheeran, T., & Zimmermann, M. (2002). Case identification of depression with self-report questionnaires. *Psychiatry Research, 109,* 51–59.

Silveira, E., Skoog, I., Sundh, V., Allebeck, P., & Steen, B. (2002). Health and well-being among 70-year-old migrants living in Sweden — results from the H 70 gerontological and geriatric population studies in Göteborg. *Social Psychiatry and Psychiatric Epidemiology, 37,* 13–22.

Souêtre, E., Martin, P., Lozet, H., & Monteban, H. (1996). Quality of life in depressed patients: comparison of fluoxetine and major tricyclic antidepressants, *International Clinical Psychopharmacology, 11,* 45–52.

Staner, L., Tracy, A., Dramaix, M., Genevrois, C., Vanderelst, M., Vilane, A., Bauwens, F., Pardoen, D., & Mendlewicz, J. (1997). Clinical and psychosocial predictors of recurrence in recovered bipolar and unipolar depressives: a one-year controlled prospective study. *Psychiatry Research, 69,* 39–51.

Stavrakaki, C., & Vargo, B. (1986). The relationship of anxiety and depression: a review of the literature. *British Journal of Psychiatry, 149,* 7–16.

Steer, R.A., Clark, D.A., Beck, A.T., & Ranieri, W.F. (1998). Common and specific dimensions of self-reported anxiety and depression: the BDI-II versus the BDI-IA. *Behaviour Research and Therapy, 37,* 183–190.

Stefanis, C.N., & Stefanis, N.C. (1999). Diagnosis of depressive disorders: A review. In: M. Maj, & N. Sartorius (Eds.), *Depressive disorders* (pp. 1–51). Chicester: Wiley.

Thornicroft G., & Sartorius, N. (1993). The course and outcome of depression in different cultures: 10-year follow-up of the WHO Collaborative study on the assessment of depressive disorders. *Psychological Medicine, 23,* 1023–1032.

Weich, S., & Lewis, G. (1998). Poverty, unemployment and common mental disorders: population-based cohort study. *British Medical Journal, 317,* 115–119.

Weich, S., Lewis, G., & Jenkins, S.P. (2001). Income inequality and the prevalence of common mental disorders in Britain. *British Journal of Psychiatry, 178,* 222–227.

Weissman, M.M. (2000). Social functioning and the treatment of depression. *Journal of Clinical Psychiatry, 61* (Suppl 1.), 33–38.

Weissman, M.M., Bland, R.C., Canino, G.J., Faravelli, C., Greenwald, S., Hwu, H.G., Joyce, P.R., Karam, E.G., Lee, C.K., Lellouch, J., Lépine, J.P., Newman, S.C., Rubio-Stipec, M., Wells, J.E., Wickramaratne, P.J., Wittchen, H., & Yeh, E.K. (1996). Cross-national epidemiology of major depression and bipolar disorder. *Journal of the American Medical Association, 276,* 293–299.

Wetzler, S., & Katz, M.M. (1989). Problems with the differentiation of anxiety and depression. *Journal of Psychiatry Research, 23,* 1–12.

World Health Organization. (1992). *The ICD-10 Classification of Mental and Behavioural Disorders. Clinical descriptions and diagnostic guidelines.* Geneva: World Health Organization.

Zigmond, A.S., & Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67,* 361–370.

Zimmermann, M., & Coryell, W. (1987). The Inventory to Diagnose Depression (IDD): a self-report scale to diagnose major depressive disorder. *Journal of Consulting and Clinical Psychology 55,* 55–59.

Zinbarg, R.E., & Barlow, D.H. (1996). Structure of anxiety and the anxiety disorders: a hierarchical model. *Journal of Abnormal Psychology, 105,* 181–193.

Zlotnick, C., Kohn, R., Keitner, G., & Della Grotta, S.A. (2000). The relationship between quality of interpersonal relationships and major depressive disorder: findings from the National Comorbidity Survey. *Journal of Affective Disorders, 59,* 205–215.

SUMMARY IN ESTONIAN

Depressioon rahvastikus: hindamine, levimus ja seosed sotsiaaldemograafilise tausta ning sotsiaalse toimimise kognitiivse aspektiga

Depressiooni mõiste tähistab tervet hulka nähtusi, alates normaalsetest emotsionaalsetest reaktsioonidest ja lõpetades kliinilise tähendusega meeleoluhäiretega. Käesolevas töös kasutatakse seda mõistet tähistamaks nii psüühika- ja käitumishäirete klassifikatsiooni RHK-10 järgi määratletud depressiivset episoodi kui ka selle episoodi iseloomulikke sümptomeid.

Meeleoluhäired ja eriti depressioon on kogu maailmas kõige sagedasemad psüühikahäired (Kessler jt, 1994; Lépine, Gastpar, Mendlewicz & Tylee, 1997). Kõrge levimus, sagedasti krooniline kulg, kaasnevad subjektiivsed kannatused ja häiritud toimimine teevad depressioonist ühe tänapäeva tähtsama terviseprobleemi.

Kuigi depressiivsete häirete esinemist on palju uuritud, puudub koosmeel depressiooni levimuse ja seostuvate faktorite kohta. Paikkonniti erinevad levimusnäitajad kaks kuni kolm korda ka siis, kui on kasutatud samast metoodikat (Lépine jt, 1997). Enamus uuringuid näitab, et vaatamata sagedasele esinemisele diagnoositakse ja ravitakse depressiooni endiselt vähe (Davidson & Meltzer-Brody, 1999; Lecrubier, Boyer, Lépine & Weiller, 1996). Struktureeritud diagnostiliste intervjuude kasutuselevõtt on suurendanud diagnostilist täpsust, samas on need vahendid igapäevatöös kasutamiseks liiga aeganõudvad. Seetõttu on endiselt populaarsed lühemad sõelküsimustikud, mille abil saab kindlaks teha võimaliku depressioonidiagnoosiga isikuid. Enesehinnanguliste küsimustike kasutamisel on probleemiks nii depressiooni eristamine ärevusest (Feldman, 1993) kui ka see, kas enesehinnanguga sedastatud depressiivsus ikka sarnanb kliinilise depressiooniga (Cox, Enns, Borger & Parker, 1999).

Lisaks subjektiivsetele kannatustele häirib depressioon inimese sotsiaalset toimimist, st tekitab probleeme tavapäraste sotsiaalsete rollide täitmisel (vt Hirschfeld *et al.*, 2000). Sotsiaalses toimimises on olulised nii objektiivne kui ka subjektiivne, hinnanguline külg ja kuigi nende vahekord depressiooni korral pole päris selge, on viimasel ajal tähelepanu pööratud just toimimise afektiivsele ja kognitiivsele aspektile (Bosc, Dubini & Polin, 1997; Prince & Prince, 2001). Toimimisraskustega pole seotud mitte üksnes kliiniliselt väljenduv depressioon, vaid ka nn alalävised depressioonid, st depressioonisümptomid, mis ei vasta täielikult häire diagnostilistele kriteeriumidele (Judd, Akiskal & Paulus, 1997). Et mitmesuguste depressioonidega seostuvad sotsiaaldemograafilised faktorid on samuti osutunud sarnasteks, on uuesti virgunud vana vaidlus, kas õigustatum on meeleoluhäirete kategoriaalne või dimensiooniline käsitlus (Stefanis & Stefanis, 1999).

Käesolev väitekiri lisab uusi andmeid mõne eeltoodud probleemi käsitlusse. Töö ühendab kahe suurema uurimisprojekti tulemusi. Uurimused **I** ja **IV** on tehtud Eesti terviseuuringu (Leinsalu, Grintšak, Noorkõiv & Silver, 1998) raames ning uurimused **II** ja **III** on osa Sergei Pakrievi juhtimisel Udmurtias teostatud psüühikahäirete uuringust.

Väitekiri keskendub täpsemalt neljale teemale:

- depressioonisümptomite mõõtmise võimalikkus enesehinnangul põhinevate meetoditega (**I** ja **II** uurimus);
- depressioonisümptomite levimus Eesti elanikkonnas (**IV** uurimus);
- depressioonisümptomite ja depressiivsete häiretega seonduvad sotsiodemograafilised ja majanduslikud tegurid (**III** ja **IV** uurimus);
- depressiooni seosed rahulolu ja kontrolli kui sotsiaalse toimimise kognitiivsete aspektidega (**III** ja **IV** uurimus).

Esitatud uurimustest lähtuvalt on väitekirja põhiseisukohad järgmised.

1. Enesehinnangul põhinevad küsimustikud sobivad depressiivsete häirete sõelumiseks elanikkonnas (**I, II** uurimus).
2. Depressiooni ja ärevuse sümptomitel on nii ühine mittespetsiifiline osa kui ka kummalegi seisundile spetsiifiline komponent (**I** uurimus).
3. Mitmedimensiooniliste enesehinnanguküsimustike eristavat valiidsust on võimalik parandada, moodustades omaette alaskaalad depressiooni ja ärevuse mittespetsiifilise ja spetsiifilise komponendi hindamiseks (**I** uurimus).
4. Enesehinnanguküsimustikega leitud depressiivsuse struktuur on sarnane kliinilise depressiooni omaga. See tulemus kinnitab oletust, et depressiooni ilmingud moodustavad kontiinuumi, st subkliinilised depressioonisümptomid ja depressiivsed häired on kvalitatiivselt sarnased ning erinevad pigem raskusastmelt (**I** uurimus).
5. Olulisi depressioonisümptomeid on 11,1%-l Eesti rahvastikust. Depressiivsust on naistel kaks korda sagedamini kui meestel (**IV** uurimus).
6. Depressiooni levimus rahvastikus on seotud sotsiaaldemograafiliste ja majanduslike teguritega. Erinevates populatsioonides ei pruugi need seosed olla päris sarnased. Mõned seonduvad faktorid, nagu sugu, töötus ning lahutatu või lese staatus näivad olevat universaalsed, st ühised nii depressiivsetele häiretele kui ka depressioonisümptomitele ega sõltu uuritavast populatsioonist. Osadel faktoritel, näiteks rahvusel, majanduslike tegurite laadil ja haridusel on eri populatsioonides depressiooniga erinevad seosed (**III, IV** uurimus).
7. Depressioon on seotud madala rahuloluga enamuses olulistes eluvaldkondades. Seos rahuloluga ei ole seletatav ainult objektiivsete elutingimustega (**IV** uurimus).
8. Depressioonil on tugev pöördvõrdeline seos kontrolliveendumustega (**IV** uurimus).

PUBLICATIONS

I

Aluoja, A., Shlik, J., Vasar, V., Luuk, K., & Leinsalu, M. (1999). Development and psychometric properties of the Emotional State Questionnaire, a self-report questionnaire for depression and anxiety. *Nordic Journal of Psychiatry*, *53*, 443–449.

Development and psychometric properties of the Emotional State Questionnaire, a self-report questionnaire for depression and anxiety

ANU ALUOJA, JAKOV SHLIK, VEIKO VASAR, KERSTI LUUK, MALL LEINSALU

Aluoja A, Shlik J, Vasar V, Luuk K, Leinsalu M. Development and psychometric properties of the Emotional State Questionnaire, a self-report questionnaire for depression and anxiety. Nord J Psychiatry 1999;53:443–449. Oslo. ISSN 0803-9488.

Anxiety and depression are dimensions of emotional state that can be validly assessed with self-report measures. This article introduces a new self-report questionnaire for depression and anxiety (Emotional State Questionnaire (EST-Q)) and presents data on its reliability and validity. The items of the EST-Q were derived from diagnostic criteria of DSM-IV and ICD-10. Thirty-three items were rated on a five-point frequency scale. The questionnaire was administered to 194 inpatients with depressive and anxiety disorders and to a population sample of 479 subjects. According to the results of factor analysis, five subscales were formed: Depression, Anxiety, Agoraphobia–Panic, Fatigue, and Insomnia. EST-Q and subscales showed acceptable internal consistency ($\alpha = 0.69–0.88$). Significant differences in subscales between patients and population and across diagnostic groups confirmed the discriminant validity of the instrument. Depression, Anxiety, and Agoraphobia–Panic subscales distinguished corresponding diagnostic groups. Fatigue and Insomnia appeared to assess nonspecific psychopathology dimensions characteristic of several psychiatric disorders
• *Agoraphobia, Anxiety, Depression, Questionnaires.*

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Self-rating scales have become increasingly popular in preliminary detection and assessment of various aspects of mental disorders. They have proved to be applicable for screening in epidemiologic studies, for recognition of psychiatric disorders in primary care, and for assessment of change in treatment programs (1, 2). Although structured diagnostic interviews, such as the Composite International Diagnostic Interview (CIDI) (3) or the Structured Clinical Interview for DSM-III-R (SCID) (4), have the best validity in psychiatric diagnostics, their administration is time-consuming and requires specific training. Self-rating scales lack the diagnostic precision of structured interviews but have the advantage in speed and ease of administration. In the case of well-established psychometric properties these instruments can be used not only as dimensional measures but also for preliminary identification of possible psychiatric cases, which is one of the reasons for development of new and efficient scales. If the main purpose of assessment were detection of mental disorders, it would be reasonable to base the scale on diagnostic criteria used in current psychiatric classifications. This idea is reflected in the recent tendency to use the self-report questions from the DSM-IV or ICD-10 criteria in creating screening instruments (5).

Depressive and anxiety disorders are the most prevalent disorders in many populations (6). These disorders cause considerable distress and also social and occupational impairment to the patients, which could be diminished by early detection and treatment already at the primary health care level. The issue whether self-rating of psychiatric symptoms is in accordance with interviewer ratings is controversial. Kearns et al. (7) showed that in depression self- and observer ratings were poorly correlated. Nevertheless, it has been shown that depression and anxiety symptoms can be reliably assessed by self-report measures, and concordance between self- and interview-based assessment is good (8–10).

Several self-rating scales have been created to assess symptoms of depression (11) and anxiety (12, 13) separately. As these conditions often coexist, it has been

considered reasonable to use rating instruments that encompass both anxiety and depression simultaneously. Some questionnaires, such as the Hospital Anxiety and Depression Scale (HAD) (14) and the Depression Anxiety Stress Scales (DASS) (15), combine only symptoms of anxiety and depression, but multidimensional scales, such as the SCL-90 (16), the Symptom Questionnaire (17), and General Health Questionnaire (GHQ) (18) also include subscales for these emotional states.

Our aim in developing the present scale, the Emotional State Questionnaire (EST-Q), was to create a self-rating instrument for detection of the symptoms characteristic of depressive and anxiety disorders. Such an instrument should be sufficiently short for quick use, but at the same time it must encompass the main symptom dimensions of these disorders on the basis of the DSM-IV and ICD-10 diagnostic criteria. We also consider it important for the questionnaire to be developed and psychometrically assessed in an Estonian population even though based on internationally accepted diagnostic criteria.

The purpose of the present article is to describe the development of the instrument and present the data for reliability and validity of the questionnaire.

Materials and Methods

Subjects

The patient sample consisted of 194 inpatients with depressive or anxiety disorders. The EST-Q was administered to all patients who were hospitalized in the ward for depressive, anxiety, and substance abuse disorders in Tartu University Psychiatric Hospital between 1 April 1997 and 30 September 1998. Patients who were diagnosed as having depression, anxiety, or other neurotic disorder on the basis of the ICD-10 criteria were included in the study. The sample consisted of 49 men and 145 women with the mean age of 39.0 years (standard deviation, 12.7 years; range, 18–72 years). ICD-10 diagnosis was established with an unstructured clinical interview by experienced psychiatrists. One hundred and twenty-three patients were diagnosed as having a depressive disorder (DD); 29 had agoraphobia with panic disorder (AP); 14, generalized anxiety disorder (GAD); 22, somatoform disorder (SF); and 6, neurasthenia (NEUR). Most of the patients with depression had moderate depression (77.5%). The EST-Q was completed on the 1st or 2nd day of admission to the hospital together with the Depression Scale (DEPS). The DEPS is a 10-item self-rating scale for screening of depression which has shown good psychometric properties (19, 20).

The non-patient sample was obtained from the respondents of the Estonian Health Interview Survey (EHIS) (21). The EHIS sample was representative of the Estonian population in January 1996. All respondents who lived in one geographic region, Tartu or Tartu County, altogether 479 subjects, were included in the current study. Of these subjects 216 were men and 263 women. Their average age was 47.0 years (standard deviation, 19.5; range, 15–79 years).

Development of the EST-Q

The items of the EST-Q are presented in Table 1 (copies of the EST-Q can be obtained on request from the corresponding author). The items were derived from the symptoms presented in diagnostic criteria for depression and anxiety disorders on the DSM-IV (22) and ICD-10 (23). We omitted somatic symptoms of anxiety from the item pool because in self-rating format it is difficult to determine whether these symptoms indicate anxiety disorder or some somatic illness. The resulting version consisted of 33 items. Each item was rated on a 5-point scale ranging from 0 to 4: 0 = not at all; 1 = seldom; 2 = sometimes; 3 = often; and 4 = all the time. The subjects were instructed to assess how much the various problems had troubled them during the past 4 weeks, using the scale.

Exploratory factor analysis of the patient group was performed to determine the subscales. Principal-component analysis with varimax rotation was used. Item-total correlations and computing of Cronbach α were used to assess the reliability of the subscales. The discriminant validity of the EST-Q was examined by comparing the mean scores of subscales with the total score in the patient and nonpatient samples and also across the diagnostic groups by using the ANOVA. The concurrent validity of the Depression subscale was assessed by correlating it with the DEPS.

Results

Table 1 presents the results of the factor analysis of the patient sample. In accordance with the eigenvalue criterion of > 1 and scree plot, a six-factor solution was selected which explained 56% of the variance. Items with factor loadings greater than 0.4 were chosen to define the meaning of the factors. Factor 1 had highest loadings on items that reflect typical symptoms of depression and also on two items of social anxiety, explaining 16% of the variance. Three items of this factor were double-loading—that is, had loadings greater than 0.4 also on some other factor. Item 8 loaded also on factor 3 (fatigue), and items 27 and 28 also on factor 6. Factor 2 was composed of agoraphobia and panic attack items and an item of fear of illness, explaining 11% of the variance. This factor had one double-loading item. Item 25, occurrence of panic attacks, loaded also on factor 4 (anxiety). Factor 3 was composed of fatigue items (9% of the variance); factor 4 can be described as a general anxiety factor (7% of the variance), and factor 5 as insomnia (7% of the variance). These five factors were easily interpreted (well defined). Factor 6, accounting for 6% of the

Table 1. Factor analysis of the EST-Q items in the patient sample.

Item	Factor loadings					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1. Feelings of sadness	0.56*	0.08	0.19	0.24	0.01	−0.06
2. Feeling easily irritated or annoyed	0.15	−0.08	0.09	0.56*	−0.07	0.33
3. Feeling no interest or pleasure in things	0.74*	0.01	0.27	0.18	0.03	−0.26
4. Fatigue or loss of energy	0.16	−0.01	0.78*	0.23	0.09	−0.09
5. Feelings of worthlessness	0.68*	−0.01	0.05	0.28	−0.01	0.27
6. Self-accusations	0.63*	−0.06	0.07	0.27	0.01	0.19
7. Recurrent thoughts of death or suicide	0.61*	0.10	0.10	0.00	0.13	0.17
8. Diminished ability to think or concentrate	0.48*	−0.05	0.45*	−0.01	−0.07	−0.03
9. Feeling slowed down	0.35	0.17	0.58*	−0.09	0.16	0.11
10. Difficulty falling asleep	0.05	−0.02	0.13	0.01	0.83*	0.01
11. Restless or disturbed sleep	0.08	0.03	0.14	0.09	0.86*	−0.06
12. Waking up too early	0.10	−0.11	0.03	0.06	0.69*	−0.20
13. Excessive sleepiness	0.05	0.11	0.53	−0.11	−0.11	0.43*
14. Loss of appetite	0.09	0.21	0.31	0.07	0.31	−0.57*
15. Excessive appetite	0.06	−0.10	0.02	0.15	−0.09	0.57*
16. Feeling lonely	0.64*	0.12	0.00	0.17	0.18	0.02
17. Hopelessness about the future	0.72*	0.06	0.15	0.14	0.08	0.02
18. Impossible to enjoy things	0.79*	0.00	0.26	0.11	−0.01	−0.24
19. Rest does not restore strength	0.35	−0.04	0.60*	0.10	0.16	−0.21
20. Feeling anxious or fearful	0.29	0.32	0.19	0.51*	−0.10	−0.01
21. Being easily fatigued	0.09	0.16	0.74*	0.11	0.17	0.07
22. Tension or inability to relax	0.29	0.21	0.33	0.44*	0.00	−0.13
23. Excessive worry about several different things	0.33	0.07	0.09	0.47*	0.04	−0.10
24. Feeling so restless that it is hard to sit still	0.20	0.03	−0.15	0.63*	0.18	−0.07
25. Sudden attacks of panic with palpitations, shortness of breath, faintness, or other frightening bodily sensations	−0.10	0.51*	0.00	0.50*	0.13	0.15
26. Easily startled	0.21	0.16	0.23	0.49*	0.14	0.32
27. Afraid to be the centre of attention	0.56*	0.34	0.13	0.05	0.05	0.45*
28. Fear of interaction with strangers	0.58*	0.33	0.10	−0.08	−0.01	0.43*
29. Fear of being outside home alone	0.18	0.73*	0.04	0.05	0.13	0.03
30. Feeling afraid in streets or open places	0.19	0.81*	0.10	−0.07	−0.05	0.02
31. Fear of fainting in public	−0.09	0.80*	0.11	0.10	−0.02	−0.07
32. Feeling afraid of travelling by bus, train, or car	0.14	0.79*	−0.02	0.07	−0.04	0.03
33. Fear of having a serious illness that has been not diagnosed by the doctors	−0.05	0.60*	0.06	0.15	−0.15	−0.20

* Loadings more than 0.4.

Table 2. Item–total correlations of the EST-Q subscales in patients.

Subscale with items	Item–total correlations
Depression	
1. Feelings of sadness	0.56
3. Feeling no interest or pleasure in things	0.69
5. Feelings of worthlessness	0.65
6. Self-accusations	0.61
7. Recurrent thoughts of death or suicide	0.55
16. Feeling lonely	0.59
17. Hopelessness about the future	0.68
18. Impossible to enjoy things	0.72
Agoraphobia–panic	
25. Sudden attacks of panic with palpitations, shortness of breath, faintness, or other frightening bodily sensations	0.43
29. Fear of being outside home alone	0.61
30. Feeling afraid in streets or open places	0.66
31. Fear of fainting in public	0.69
32. Feeling afraid of travelling by bus, train, or car	0.67
Anxiety	
2. Feeling easily irritated or annoyed	0.33
20. Feeling anxious or fearful	0.50
22. Tension or inability to relax	0.46
23. Excessive worry about several different things	0.40
24. Feeling so restless that it is hard to sit still	0.37
26. Easily startled	0.47
Fatigue	
4. Fatigue or loss of energy	0.65
8. Diminished ability to think or concentrate	0.46
9. Feeling slowed down	0.50
19. Rest does not restore strength	0.56
21. Being easily fatigued	0.59
Insomnia	
10. Difficulty falling asleep	0.60
11. Restless or disturbed sleep	0.71
12. Waking up too early	0.48

variance, had the highest loadings on appetite and excessive sleepiness items and also two items of social anxiety, which also loaded more than 0.5 on the depression factor. Considering the ambiguous nature of the sixth factor, we maintained only the first five factors as a basis for EST-Q subscales. Still, we tentatively retained the remaining items on the EST-Q questionnaire for further analysis and included them in computing the total score. Inclusion of double-loading items in subscales was based on their accordance with the diagnostic criteria of the DSM-IV. On the same principle we excluded items of social anxiety from depression subscale and the item of excessive fear of illness from the agoraphobia–panic subscale. As a result, the following five subscales were formed (Table 2): Depression with eight items (1, 3, 5–7, 16–18), Anxiety with six items (2, 20, 22–24, 26), Agoraphobia–Panic with five items (25, 29–32), Fatigue with five items (4, 8, 9, 19, 21), and Insomnia with three items (10–12).

The internal reliability of the total scale and subscales was assessed by computing Cronbach's α reliability coefficients in patient group. The total EST-Q had an α of 0.88, the Depression scale, 0.87; Anxiety, 0.69; Agoraphobia–Panic, 0.82; Fatigue, 0.77; and Insomnia, 0.76. All subscales were internally consistent, with α values exceeding 0.6. Correlations of items with sum scores of subscales are reported in Table 2. In the Depression scale all items correlated with the total score with r greater than 0.55. The lowest item–total correlations were found in the Anxiety scale. At the same time, when we computed the same data only in a group of patients with anxiety disorders, the correlations turned out to be satisfactory (0.56 for item 2, 0.61 for item 20, 0.66 for item 22, 0.44 for item 23, 0.54 for item 24, and 0.67 for item 26). Other subscales had satisfactory item–total correlations. The reliability data in the nonpatient sample were similar and therefore are not separately reported.

Table 3 shows the mean values of the EST-Q total score and subscale scores of the patient sample and the population sample. The nonpatient group had significantly lower values on all subscales and also on the total score. The mean scores of the subscales across the diagnostic groups are presented in Table 4. The diagnostic groups differed significantly with regard to all EST-Q subscales. The post-hoc Tukey HSD test showed the following significant differences between patient groups. The Depression subscale had the highest score in the group of depressive patients. The DD group had statistically significant differences in Depression score compared with the AP, GAD, and SF patients ($P < 0.05$). The Agoraphobia–Panic subscale score was significantly higher in the AP patient group than in all other diagnostic groups ($P < 0.05$).

The Anxiety score was highest in the GAD patients, distinguishing this group significantly from DD, AP, and SF patients ($P < 0.05$). Fatigue and Insomnia subscales showed significant difference only between DD and AP groups ($P < 0.05$).

Table 5 shows the Pearson product–moment correlations between EST-Q total score, subscales, and the DEPS, an additional measure of depression in the patient group. All subscales had moderately significant correlations with each other except Insomnia, which was not related to Agoraphobia–Panic and Anxiety. All subscales correlated significantly with the EST-Q total score and the DEPS. The DEPS had the strongest relationship with the Depression subscale.

Discussion

The EST-Q showed satisfactory psychometric properties. Factor-analytically derived subscales had adequate internal consistency, indicating that the EST-Q is a reliable instrument in the assessment of such psychopathology dimensions as depression, general anxiety, agoraphobia–panic, fatigue, and insomnia. The Depression subscale had the highest internal consistency, and the Anxiety subscale the lowest. This is similar to the results found with other multidimensional instruments in which subscales assessing depression have higher internal consistency than those measuring anxiety (24–26). Possibly, depression is a better-defined and more unitary construct than anxiety. The factor structure of the EST-Q confirmed the expectation of separate depression and anxiety factors containing items corresponding to diagnostic criteria of depression and generalized anxiety. As in other questionnaires measuring general and phobic anxiety separately (16), these constructs were also separated by factor analysis in our study. Unexpected was emergence of a distinct fatigue factor. Symptoms of low energy and easy fatigability are usually included in diagnostic criteria for depressive disorders and constitute part of rating scales for depression (11, 19).

The scores on the EST-Q of patient and population samples differed sufficiently to conclude that the instrument has a good discriminative validity. The comparison of diagnostic groups supports the idea that three subscales are diagnosis-specific and can be used in

Table 3. Mean EST-Q scores in patient and nonpatient groups.

	Patient		Nonpatient			
Subscales	Mean	*s*	Mean	*s*	*F* (DF)	*P*
Depression	17.9	6.6	5.0	4.9	780.65 (1, 671)	<0.001
Agoraphobia–panic	5.5	4.8	0.9	2.3	290.30 (1,671)	<0.001
Anxiety	15.4	3.9	5.0	4.2	893.32 (1, 671)	<0.001
Fatigue	12.8	3.8	4.7	3.8	622.23 (1, 671)	<0.001
Insomnia	7.3	3.1	2.7	3.1	304.98 (1, 671)	<0.001
EST-Q total score	67.8	17.8	20.6	16.1	1115.97 (1, 671)	<0.001

s = Standard deviation.

Table 4. Mean values of the EST-Q subscales across the diagnostic groups.

	Diagnostic group											
	DD		AP		GAD		SF		NEUR			
Subscale	Mean	*s*	Mean	*s*	Mean	*s*	Mean	*s*	Mean	*s*	*F* (DF)	*P*
Depression	19.6	6.1	15.5	5.6	14.9	5.5	14.9	7.7	12.3	8.0	6.67 (4, 189)	<0.001
Agoraphobia–panic	4.2	3.9	11.2	5.3	6.9	2.9	5.5	4.3	2.0	2.3	19.08 (4, 189)	<0.0001
Anxiety	15.5	3.5	14.7	4.2	18.8	2.5	13.6	4.7	14.8	4.3	4.55 (4, 189)	<0.005
Fatigue	11.5	2.9	9.4	3.3	11.6	2.8	10.6	3.4	11.2	3.3	3.73 (4, 189)	<0.01
Insomnia	7.9	4.0	5.5	3.0	8.3	2.5	7.3	3.4	5.7	4.0	3.75 (4, 189)	<0.01

s = Standard deviation.

Table 5. Correlations of the EST-Q subscales, total score, and the Depression Scale in the patient group.

	Total score	DEPS	Depression	Agoraphobia–panic	Anxiety	Fatigue	Insomnia
Total score	1.00						
DEPS	0.79*	1.00					
Depression	0.81*	0.89*	1.00				
Agoraphobia–panic	0.55*	0.20*	0.20*	1.00			
Anxiety	0.73*	0.49*	0.55*	0.32*	1.00		
Fatigue	0.73*	0.67*	0.59*	0.18*	0.45*	1.00	
Insomnia	0.34*	0.34*	0.18*	−0.01	0.14	0.27*	1.00

* Significant correlations, $P < 0.05$.

differentiating anxiety and depressive disorders. One subscale, Agoraphobia–Panic, is highly discriminative. The validity of the Depression scale is further confirmed by its high correlation with another measure of depression, the DEPS. Two subscales, Fatigue and Insomnia, are not discriminative across diagnostic categories. This finding supports results from other studies indicating that self-rated symptoms of fatigue and insomnia are equally characteristic of depressive and anxiety states (27). We therefore suggest that these subscales assess general symptom dimensions, which characterize several psychiatric disorders.

Usually, high correlations have been found between measures of anxiety and depression (24, 28, 29). This and high comorbidity of corresponding disorders have led to the proposition of a large common component in anxiety and depression (30). This overlap may constitute difficulties in separating anxiety and depression by means of self-report measures. It has even been suggested that self-rating scales assess general negative mood, not distinct constructs of anxiety and depression, and therefore are not suitable for distinguishing these mood states (31, 32). Our data show correlations between anxiety and depression which are significant but not so large that we could conclude that they are different facets of the same phenomenon. Moreover, the factor structure of the EST-Q suggests that, at least in clinical samples, although significantly correlated, depression and anxiety are separate constructs and represent distinct symptom dimensions. This is in accordance with the results of Burns & Eidelson (33), who also obtained separate anxiety and depression factors. Keeping items of fatigue and insomnia apart from core symptoms of anxiety and depression may be one factor that improves the discriminative power of the respective subscales. Often questionnaires for anxiety and depression contain similar items of both fatigue and sleeping problems (12, 13), which may be one reason for the high overlap of the self-rating of these conditions. The EST-Q therefore appears to be promising in distinguishing depressive and anxiety disorders, as it has disorder-specific and nonspecific symptoms in separate subscales.

Some limitations of this study should be mentioned. This report is based on the assessment of psychiatric patients and a population sample. As no diagnostic interview was used in the population sample, we could not determine the exact cut-off points of subscales for screening purposes. Another limitation is the unequal size of patient groups, with the overrepresentation of depressive disorders compared with anxiety disorders.

In conclusion, the EST-Q is a reliable and valid instrument for assessing such psychopathology dimensions as depression, general anxiety, agoraphobia–panic, fatigue, and insomnia. Good differentiating properties suggest its usefulness as a screening instrument. Whether this scale is also sensitive to change and could be used as an assessment tool in treatment efficacy research remains a topic for further research.

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References

1. Glass RM, Uhlenhuth EH, Kellner R. The value of self-report assessment in studies of anxiety disorders. J Clin Psychopharmacol 1987;7:215–21.
2. Clarke DM, Smith GC, Herrman HE. A comparative study of screening instruments for mental disorders in general hospital patients. Int J Psychiatry Med 1993;23:323–37.
3. World Health Organization. Composite International Diagnostic Interview 1.1 (CIDI). Geneva: World Health Organization; 1993.
4. Spitzer R, Williams J, Gibbon M, First M. Structured Clinical Interview for DSM-III-R (SCID). Washington (DC): American Psychiatric Association; 1990.
5. Wittchen H-U, Boyer P. Screening for anxiety disorders. Br J Psychiatry 1998;173 Suppl 34:10–7.
6. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. Arch Gen Psychiatry 1994;51:8–19.
7. Kearns NP, Cruickshank CA, McGuigan KJ, Riley SA, Shaw SP, Snaith RP. A comparison of depression rating scales. Br J Psychiatry 1982;141:45–9.
8. Svanborg P, Asberg M. A new self-rating scale for depression and anxiety states based on the Comprehensive Psychopathological Rating Scale. Acta Psychiatr Scand 1994;89:21–8.
9. Craig TJ, Jandorf L, Rubinstein J. Interrater and observer/self-report correlation of psychopathology in routine clinical practice. Ann Clin Psychiatry 1995;7:25–31.
10. Mattila-Evenden M, Svanborg P, Gustavsson P, Asberg M. Determinants of self-rating and expert rating concordance in psychiatric out-patients, using the affective subscales of the CPRS. Acta Psychiatr Scand 1996;94:386–96.
11. Beck AT, Ward CH, Mendelson M, Mock JE, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561–85.
12. Spielberger CD, Gorsuch RL, Lushene R, Vagg PR, Jacobs GA. Manual for the State-Trait Anxiety Inventory. Palo Alto (CA): Consulting Psychologists Press; 1983.
13. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol 1988;56:893–7.
14. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67:361–70.
15. Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behav Res Ther 1995;33:335–43.
16. Derogatis LR, Lipman RS, Covi L. SCL-90: an outpatient psychiatric rating scale—preliminary report. Psychopharmacol Bull 1973;9:13–28.
17. Kellner R. A symptom questionnaire. J Clin Psychiatry 1987;48:268–74.
18. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. Psychol Med 1979;9:139–45.
19. Salokangas RK, Poutanen O, Stengard E. Screening for depression in primary care. Development and validation of the Depression Scale, a screening instrument for depression. Acta Psychiatr Scand 1995;92:10–6.
20. Pakriev S, Vasar V, Aluoja A, Saarma M, Shlik J. Screening for depression in the rural population in Udmurtia. Nord J Psychiatry 1997;51:325–30.
21. Leinsalu M, Grintshak M, Noorkõiv R, Silver B. Estonian health Interview Survey 1996. Methodological report. Tallinn: Institute of Experimental and Clinical Medicine; 1998.
22. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington (DC): American Psychiatric Association; 1994.
23. World Health Organization. The ICD-10 classification of mental and behavioural disorders. Diagnostic criteria for research. Geneva: World Health Organization; 1993.

24. Zeffert S, Clark A, Dobson CJ, Jones A, Peck D. The Symptom Questionnaire: British standardization data. Br J Clin Psychol 1996;35:85–90.
25. Brown TA, Chorpita BF, Korotitsch W, Barlow DH. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. Behav Res Ther 1997;35:79–89.
26. Holi MM, Sammallahti PR, Aalberg VA. A Finnish validation study of the SCL-90. Acta Psychiatr Scand 1998;97:42–6.
27. El-Rufaie OE, Absood GH, Abou-Saleh MT. The primary care anxiety and depression (PCAD) scale: a culture-oriented screening scale. Acta Psychiatr Scand 1997;95:119–24.
28. Dobson KS. An analysis of anxiety and depression scales. J Pers Assess 1985;49:522–7.
29. Spinhoven P, Ormel J, Sloekers PP, Kempen GI, Speckens AE, Van Hemert AM. A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. Psychol Med 1997;27:363–70.
30. Clark LA, Watson D. Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. J Abnorm Psychol 1991;100:316–36.
31. Wetzler S. Methodological issues for the differentiation of anxiety and depression. Clin Neuropharmacol 1986;9 Suppl 4:248–50.
32. Feldman LA. Distinguishing depression and anxiety in self-report: evidence from confirmatory factor analysis on nonclinical and clinical samples. J Consult Clin Psychol 1993;61:631–8.
33. Burns DD, Eidelson RJ. Why are depression and anxiety correlated? A test of the tripartite model. J Consult Clin Psychol 1998;66:461–73.

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Screening for depression in the rural population in Udmurtia

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Pakriev S, Vasar V, Aluoja A, Saarma M, Shlik J. Screening for depression in the rural population in Udmurtia. Nord J Psychiatry 1997;51:325–330. Oslo. ISSN 0803–9488.

The Russian version of the Depression Scale (DEPS), consisting of 10 items, was used for screening for depressive disorders in the general population in the Udmurt Republic. The randomly selected study group consisted of individuals aged 18 to 65 years who lived in rural areas. Diagnostic assessments were made on the basis of the Composite International Diagnostic Interview 1.1 of 855 inhabitants. The DEPS proved to be satisfactory in different groups of the population on the basis of sex and nationality. The sensitivity of the DEPS for clinical depression was 78%, and the specificity for non-depression was 73%. The sensitivity for severe depression was 70%, for moderate depression 84%, and for mild depression 78%. The DEPS seems to be suitable for primary screening for depression in the general population.

☐ *Depression; General population; Screening.*

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The prevalence of depression according to different community surveys around the world is 3–18% (1–4). Despite the relatively high rate of depressive disorders among primary health care patients (5–9) a considerable number of persons with depression remain unidentified (10, 11). At the same time various studies have shown that cases of depression identified by general practitioners have a better outcome than unrecognized depression (12, 13). General practitioners thus need to be able to identify and treat depression.

With the aim of better recognition of depression, various self-report screening scales have been developed (14, 15). Barrett et al. (16) developed a screening instrument that was validated within the primary care setting and had an acceptable correspondence with depression diagnosed by a standardized interview method. Salokangas et al. (17) modified this instrument, omitting items with a low response rate and a poor ability to differentiate depression from other mental disorders, resulting in the 10-item Depression Scale (DEPS). The DEPS was used in screening for depression in primary care, and results showed high sensitivity of the DEPS for clinical depression (74%) and specificity for non-depression (85%) (17).

The DEPS was translated into the Russian language at the Department of Psychiatry of the University of Tartu and was used as a screening instrument for depression in this study. The aim of the study was to investigate the reliability of the Russian version of the Depression Scale and validate it in the community of the rural population in Udmurtia.

Materials and methods

The study was carried out in Udmurtia between February 1995 and December 1995. Udmurtia lies about 500 km to the west of the Urals and about 1000 km to the east of Moscow and is the homeland of the Udmurts, whose language belongs to the Finno-Ugric family of languages. There are more than 1.6 million inhabitants in Udmurtia according to the 1989 census. Udmurts, Russians, and other nationalities live in the Republic. Most of the rural population in Udmurtia are Udmurts.

For the study four villages in different areas of Udmurtia were selected. Two villages ("L" and "O") represent two districts of north Udmurtia; one village ("P") is situated in central Udmurtia, and one village ("B") is situated in south Udmurtia. The villages selected were the most typical villages of Udmurtia on the basis of their demographic characteristics, culture, and traditions.

Table 1. Population of the investigated villages (L, B, O, and P) and number and percentage of investigated persons by the DEPS and the CIDI.

	No. of inhabitants		Study sample	
Village	Total no. of inhabitants	No. 18–65 years old	No. of interviewed persons	% of target population
L	1066	613	197	32.1
B	1572	907	250	27.6
O	1450	838	220	26.3
P	1719	1054	188	17.8

Every third person from the target population in three villages and every fifth in one village were drawn by systematic random sampling from lists of inhabitants in the age range of 18–65 years (Table 1). The sample consisted of 995 individuals who lived in one of the four villages. Seventy-eight men and 24 women refused to participate in the study, and 38 individuals were not in their home or place of work during the study for different reasons. Thus 855 inhabitants were involved in the study, including 487 (57%) men and 368 (43%) women; 569 (67%) were Udmurts, 270 (31%) Russians, and 16 (2%) another nationality. All subjects could read and speak Russian fluently. The subjects were given DEPS, and each of them was interviewed using the Composite International Diagnostic Interview 1:1 (CIDI) (18). The assessment by means of the DEPS and CIDI interviews was implemented in one session in each case. The interviews were conducted by one interviewer who had been trained in the use of the CIDI. When necessary, especially in the case of respondents with advanced age or when respondents had some difficulty in filling out the DEPS, supplementary guidance was given in completing the questionnaire. The questions in the DEPS are shown in Table 2. Each item of the scale is scored from 0 to 4; the range of the total score is from 0 to 30. The definition of mental disorders was made by using the CIDI, and validation of the DEPS was based on the diagnoses of depression by the criteria of the ICD-10 (World Health Organisation, 1992). In the interview, information was elicited

Table 2. Items of the DEPS and intercorrelations between items and sum scores.

During the last month, I have	Not at all	A little	Quite a lot	Extremely much	r^*
Suffered from insomnia	0	1	2	3	0.43
Felt blue	0	1	2	3	0.64
Felt everything was an effort	0	1	2	3	0.54
Felt low in energy or slowed down	0	1	2	3	0.63
Felt lonely	0	1	2	3	0.58
Felt hopeless about the future	0	1	2	3	0.67
Not got any fun out of life	0	1	2	3	0.63
Had feelings of worthlessness	0	1	2	3	0.66
Felt all pleasure and joy had gone from life	0	1	2	3	0.70
Felt that I cannot shake off the blues even with help from family and friends	0	1	2	3	0.66

* Intercorrelations between items and sum scores.

on the occurrence of diagnoses during the preceding month, preceding year, and life-time occurrence. In the validation of the DEPS, only the occurrence of disorders in the preceding month was considered. For all respondents anonymity was guaranteed and personal data were coded.

The internal consistency of the DEPS was examined by calculating Pearson's correlation coefficient between the individual items and their sum scores and by calculating Cronbach's alpha for the whole scale. The external validity of the DEPS was tested by calculating the percentage of the respondents with the CIDI depressions (severe, moderate, or mild) in various DEPS categories.

On the basis of the CIDI, three categories of depression were defined: 1) severe depression, consisting of the cases with ICD-10 diagnoses of F32.2, F32.3, F33.2, and F33.3, 2) moderate depression, or cases with ICD-10 diagnoses of F32.1 and F32.1, and 3) mild depression, or cases with ICD-10 diagnoses of F32.0, F33.0, and F34.1. One respondent classified as having severe depression had a diagnosis of bipolar affective disorder, current episode mixed (F31.6).

One hundred and ninety-one respondents with the single diagnosis of tobacco dependence syndrome (F17.2) were classified as not having a diagnosis.

Results

The 1-month rate of depressive disorders in accordance with the ICD-10 diagnostic criteria for all respondents in the age range from 18 to 65 years was 27.3% (233 cases of a total of 855).

Table 3. Mean DEPS scores in subjetcs with and without depressive disorders.

	Mean DEPS score	*s*	*n*
Total group of depression	11.4*	4.8	233
Severe depression	11.3*	5.2	50
Moderate depression	11.8*	4.6	85
Mild depression	10.9*	4.9	98
Without a diagnosis of depression	6.5	3.9	622

* Significant differences from the group without depression, $P < 0.001$; *s* = standard deviation.

The 1-month prevalence of severe depression was 21.5% (total, 50 identified cases) of all cases of depression, that of moderate depression was a total of 85 cases, or 36.5%, and that of mild depression a total of 98 cases, or 42.1%.

For 416 subjects other mental diagnoses were defined (48.7% of the study group), and 206 respondents were not assigned a diagnosis.

All 885 subjects who had completed the DEPS screening questionnaire had answered every item. Cronbach's alpha, which reflected the internal consistency of the screen, was 0.82. With the exception of the questions "Suffered from insomnia", "Felt everything was an effort" and "Felt lonely", the correlations of the item scores with the sum score of the screen were more than $r = 0.60$ (Table 2).

The discriminatory ability of the DEPS was examined by comparing the scores obtained by the respondents who met the criteria for depres-

Table 4. Percentage and number of respondents with depression in accordance with ICD-10 diagnostic criteria with different total scores of DEPS.

	Total scores on the DEPS										
	0–2	3–5	6–8	9–11	12–14	15–17	18–20	21–23	24–26	27–30	*n*
% of persons with diagnosis of depression of the number of interviewed persons	7.2	10.2	11.4	38.0	67.0	59.5	66.7	77.8	66.7	100	
Total number of persons with depressive disorder	6	25	20	68	65	25	14	7	2	1	233
Total number of interviewed persons	83	244	176	179	97	42	21	9	3	1	855

sion and those without depression (Table 3). The mean score on the DEPS for persons with a diagnosis of depression according to the diagnostic criteria of the ICD-10 was 11.4, and that for non-depressive persons was 6.5 (P <0.001).

The proportion of the subjects assessed in the CIDI interview with a diagnosis of depression in various DEPS score categories is shown in Table 4. When the DEPS score exceeded 9, the percentage of diagnoses of depression rose sharply. To ascertain whether a score of 9 is the best cut-off point, the sensitivity and specificity for the 8- and 10-point cut-offs were also estimated (Table 5). For the 8-point cut-off the sensitivity was 80.7% and the specificity 66.3%; for the 9-point cut-off the sensitivity was 78.1% and specificity 72.7%, and for the 10-point cut-off the sensitivity was 67% and specificity 78.6%. Therefore the best balance between sensitivity and specificity was obtained at a cut-off point of 9, and the Russian version of the DEPS had a sensitivity – that is, the percentage of correctly diagnosed cases of depression – of 78.1% and a specificity – that is, the percentage of correctly identified cases of non-depression – of 72.7%. The proportion of the subjects with a DEPS score of 9 or more was 41.2%.

The condition clearly best identified by the DEPS was moderate depression. Only 16.5% of these cases remained unrecognized, whereas 30% of the cases of severe depression and 22.4% of the cases of mild depression remained unidentified (Table 6). In terms of sensitivity, the screen worked more effectively among the Udmurts than among the Russians – 82.7% and 66.7%, respectively. The same holds for women and men: 80.4% and 71.7%, respectively.

Table 5. Sensitivity and specificity of DEPS at cut-off points, 8, 9, and 10.

	Value of cut-off point		
	8	9	10
Sensitivity	80.7	78.1	67.0
Specificity	66.3	72.7	78.6

Discussion

The study confirmed that the Russian version of the DEPS was a reliable instrument for screening of depression in the general population. Its internal consistency was high, and the alpha coefficient of the Russian version (0.82) was comparable to that obtained in the Finnish study (0.88) by Salokangas et al. (17). The DEPS is brief, consisting of 10 items only and takes a short time to complete. The questions were easy to understand for respondents with different nationality, age, education, and sex, and the ability to complete the DEPS was not affected by the subject's belonging to various social groups. Only respondents with severe depression and advanced age who have cognitive disorders (19–22) may need additional guidance in completing the DEPS. Our results showed that persons with a CIDI-diagnosed depression scored significantly higher on the DEPS than those without depression. At the same time there were no reliable differences between mean scores of severe, moderate, and mild depression. Perhaps the DEPS reflected inadequate self-esteem and some depression-related impairments in motivation and lack of interest in respondents with severe depression.

Despite this limitation, the DEPS detected cases of depression reasonably well. Its sensitivity (78%) and specificity (73%) were similar to the results obtained by Salokangas et al. (17) (74% and 85%, respectively), and by Barrett et al. (16) (74% and 87%, respectively). These two studies concerning the external validation of the questionnaire were, however, carried out in primary care. The present study involved the general population, and all inhabitants who completed the DEPS, despite their mean score on it, were interviewed using the CIDI. The DEPS in

Table 6. CIDI diagnoses of respondents by DEPS scores with less than and more than 9 points.

	DEPS scores		Total	Identified
	<9	≥9+	no.	cases, %
Mild depression	22	76	98	77.6
Moderate depression	14	71	85	83.5
Severe depression	15	35	50	70.0
Other diagnosis	290	126	416	30.0
No diagnosis	162	44	206	21.4
Total	503	352	855	41.0

the present study thus seems to work at least as well as in the above studies. Still, there were some differences: the specificity of the DEPS was a little lower in Udmurtia than in Finland (17). The sensitivity was higher in women than in men, whereas in Finland the screen functioned equally well in both sexes. Perhaps the differences in the diagnostic interviews (9th version of the PSE and CIDI) and study subjects (primary care patients and general population) may account for these results. Furthermore, we must consider the fact that PSE is based on ICD-8, but CIDI 1.1 gives the diagnosis in accordance with ICD-10. The sensitivity of our study would probably be higher than 78% if the CIDI included cases of recurrent brief depression (23, 24).

Nevertheless, the sensitivity and specificity of the Russian version of the DEPS proved to be satisfactory. According to Paykel & Priest (9), about half of the cases of depression are identified by general practitioners at the first treatment visit. The DEPS was able to identify approximately three-fourths of all cases of depression and as many as 70% of cases of severe depression and 84% of moderate depression in the screening of the general population.

We may conclude that the DEPS is an effective screening instrument for recognizing high-risk groups for depression in different national and cultural contexts. The Russian version of the DEPS has satisfactory psychometric properties and can be a useful help for general practitioners in clinical work and in studying the prevalence of depression in general population.

References

1. Angst J. Epidemiology of depression. Psychopharmacology 1992;106:71–74.
2. Weissman MM, Bruce ML, Leaf PJ, Florio LP, Holzer C. Affective disorders. In: Psychiatric disorders in America: the epidemiologic catchment area study. New York: Free Press; 1991. p. 53–80.
3. Henderson AS, Jorm AF, Mackinnon A. The prevalence of depressive disorders and the distribution of depressive symptoms in later life: a survey using draft ICD-10 and DSM-III-R. Psychol Med 1993;23:719–29.
4. Wittchen H-U, Essau CA, von Zerssen D, Krieg JC, Zaudig M. Lifetime and 6-month prevalence of mental disorders in the Munich Follow-up Study. Eur Arch Psychiatry Clin Neurosci 1992; 241:247–58.
5. Barrett JE. Naturalistic change after 2 years in neurotic depressive disorders (RDC categories). Compr Psychiatry 1984;25:404–18.
6. Barrett JE, Barrett JA, Oxman TE, Gerber PD. The prevalence of psychiatric disorders in a primary care practice. Arch Gen Psychiatry 1988;45: 1100–6.
7. Block M, Schulberg HC, Coulehan JC, McClelland M, Gouding W. Diagnosing depression among new patients in ambulatory training settings. J Am Board Fam Pract 1988;1:91–7.
8. Goldberg D. Detection and assessment of emotional disorders in a primary care setting. Int J Ment Health 1979;8:30–48.
9. Paykel ES, Priest RG. Recognition and management of depression in general practice: consensus statement. Br Med J 1992;305:1198–202.
10. Weissman MM, Klerman GL. The chronic depressive in the community: unrecognized and poorly treated. Compr Psychiatry 1977;18:523–32.
11. Andersen SM, Harthorn BH. The recognition, diagnosis, and treatment of mental disorders by primary care physicians. Med Care 1989;27:869–86.
12. Ormel J, Koeter H, van den Brink W, van de Willige G. The extent of non-recognition of mental health problems in primary care and its effect on management and outcome. In: Goldberg D, Tantam D, editors. The public health impact on mental disorder. Basel: Hogrefe-Huber; 1990. p. 154–64.
13. Freeling P, Tylee A. Depression in general practice. In: Paykel S, editor. Handbook of affective disorders. 2nd ed. Singapore: Churchill Livingstone; 1982. p. 651–66.
14. Beck AT. Depression: clinical, experimental and theoretical aspects. Philadelphia: University of Pennsylvania Press; 1967.
15. Zung WWK. A self-rating depression scale. Arch Gen Psychiatry 1965;12:63–70.
16. Barrett J, Oxman T, Gerber P. Prevalence of depression and its correlates in general medical practice. J Affect Disord 1987;12:167–74.
17. Salokangas RKR, Poutanen O, Stengard E. Screening for depression in primary care. Development and validation of the Depression Scale, a screening instrument for depression. Acta Psychiatr Scand 1995;92:10–6.
18. Composite International Diagnostic Interview (CIDI). Geneva: World Health Organization; 1993.
19. Wittchen H-U, Knäuper B, Kessler RC. Lifetime risk of depression. Br J Psychiatry 1994;165 Suppl 26:16–22.
20. Weissman MM, Myers JK, Tischler GL. Psychiatric disorders (DSM-III) and cognitive impairment among the elderly in a US urban community. Acta Psychiatr Scand 1985;71:366–79.
21. Fuhrer R, Antonucci TC, Gagnon M, Dartigues JF, Barberger-Gateau P, Alperovitch A. Depressive symptomatology and cognitive functioning: an epidemiological survey in an elderly community sample in France. Psychol Med 1992;22:159–72.
22. Robbins TW, Joyce EM, Sahakian BJ. Neuropsychology and imaging. In: Paykel ES, editor. Handbook of affective disorders. 2nd ed. Singapore: Churchill Livingstone; 1992. p. 289–309.

23. Goldberg D, Bridges K. Screening for psychiatric illness in general practice: the general practitioner versus the screening questionnaire. J R Coll Gen Pract 1987;37:15–8.
24. Angst J, Merikangas K, Scheidegger P, Wicki W. Recurrent brief depression. A new subtype of affective disorder. J Affect Disord 1990;19:87–98.

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III

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Prevalence of mood disorders in the rural population of Udmurtia

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A sample of 855 rural adult inhabitants of Udmurtia was interviewed by means of the Composite International Diagnostic Interview (CIDI) in order to investigate the incidence and prevalence of mood disorders. Depression affected 30.5% of the population according to ICD-10, and 22% according to DSM-III-R over a 12-month period. Depressive disorders were more common in women (40.5%) than in men (17.4%), and in subjects who were widowed (68.8%), divorced (55.6%) or had poor family relationships. Depression was not related to ethnicity, educational level, income or living conditions. Depression showed a high level of comorbidity with social phobia in Udmurts and with persistent somatoform pain disorder in Russian women. The annual incidence of depressive episode was 7.5%, and the highest risk of depression was among younger women and older men.

Key words: mood disorders; depression; rural population; epidemiology

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Introduction

Depression is a common disorder with a lifetime prevalence ranging from 3% to 35% according to different community surveys (1–6). This variability in prevalence may be explained by the differences in the methodology of assessment (diagnostic criteria, different instruments) and also by specific features of the studied population (7, 8). Most studies agree that women tend to suffer from depression more frequently than men. This gender difference has been shown to be unrelated to help-seeking behaviour (9). Findings about other correlates of depression are not so consistent. It has been reported that the risk of depression increases with age. However, recent findings have shown a considerably higher prevalence of depression in younger than in older people (8). Depression has been found to be comorbid with other disorders, particularly with disorders associated with the use of alcohol, eating disorders and anxiety disorders, but the nature of the comorbidity is controversial and requires further study (10). Despite its high prevalence in the general population, the majority of depressed patients remain unrecognized and inadequately treated (11, 12). Epidemiological data on prevalence, comorbidity and risk factors for depression are important for providing information for social and health care policy, planning services and developing preventive activities (7, 12). The purpose of the present study was to explore the prevalence of depression and the relationships between depression and various sociodemographic factors in the rural population of Udmurtia. This is the first epidemiological study of depression in Udmurtia which has been conducted using an internationally accepted diagnostic instrument based on the current classifications of psychiatric disorders.

Material and methods

The study was conducted between February 1995 and December 1995 in Udmurt Republic, which is situated about 500 km to the west from the Urals and 1000 km to the east from Moscow. The Udmurt language belongs to the Finno-Ugric family of languages. According to the 1989 census the population of Udmurtia is about 1.6 million, including 496 500 (30.9%) Udmurts, 945 200 (58.9%) Russians and 163 700 (10.2%) inhabitants with other ethnic backgrounds. The majority (57.8%) of the rural population are Udmurts (Russians represent 37.1% and others represent 5.1%).

The present study was conducted in four villages located in different areas of Udmurtia. The studied

sample was drawn from the lists of residents in the age range 18 to 65 years by systematic random sampling. From a total of 995 selected subjects, 102 subjects (78 men and 24 women) refused to participate and 38 subjects were not available for interview for various reasons. Thus the study population consisted of 855 subjects, including 368 men (43%) and 487 women (57%). The mean age of the men was 38.4 years and the mean age of the women was 37.3 years. With regard to ethnic origin, 569 (67%) of them were Udmurts, 270 (31%) were Russians and 16 (2%) represented other nationalities. For detection of mental disorder we used the Russian version of the Composite International Diagnostic Interview (CIDI), version 1.1. The interviews were conducted in the Russian language as all of the study subjects were fluent in Russian. The CIDI is a fully structured comprehensive psychiatric interview designed to diagnose mental disorders according to the ICD-10 Diagnostic Criteria for Research and DSM-III-R definitions (13). The CIDI allows the occurrence of ICD-10 psychiatric disorders during the last month, last year and lifetime to be determined. Additional data were collected from the respondents concerning their living conditions, average monthly income per one family member in $US, and self-evaluation of family relationships. Family relationships were classified as 'good', 'satisfactory' or 'bad'. All personal data obtained from the participants were kept strictly confidential. Diagnostic evaluations were made by a clinician who had been trained in the use of the CIDI. Interviews were administered in one session at the home or workplace of the respondents.

The following categories of depression were defined on the basis of the CIDI-derived diagnoses according to severity: (i) severe depression, consisting of the cases with ICD-10 diagnoses F32.2, F32.3, F33.2 and F33.3; (ii) moderate depression, consisting of cases with ICD-10 diagnoses F32.1 and F33.1; and (iii) mild depression, consisting of cases with ICD-10 diagnoses F32.0, F33.0 and F34.1. One respondent classified as having severe depression had a diagnosis of bipolar affective disorder (F31.6). A total of 191 respondents with the single diagnosis of tobacco dependence syndrome (F17.2) were considered not to have a diagnosis of mental disorder.

Results

The lifetime prevalence of mood disorders in the total sample was 42.8% (366 of 855 cases) (Table 1), the 1-year prevalence was 30.5% (261 cases) and the 1-month prevalence was 27.3% (233 cases) according to ICD-10. According to DSM-III-R these rates were considerably lower, the lifetime prevalence for mood disorders being 31.6%, the 1-year prevalence being 22.0% and the 1-month prevalence being 19.5%. The 1-month and 1-year prevalences were higher for mild depression (11.5% and 12.6%, respectively) than for moderate (9.9% and 11.2%, respectively) and severe (5.9% and 6.7%, respectively) forms. However, according to the lifetime rate, the cases with moderate depression showed the highest prevalence, of 17.2% (15.1% for mild and 10.5% for severe depression). The lifetime and 1-year rates of depression were higher for women (Table 2). The female/male ratio was 2.3 for the 1-year prevalence and 1.9 for the lifetime prevalence. The ages of onset of depression for men and women were similar (in men the mean age of onset was 24 years and in women it was 23.1 years).

The prevalence rates for various ICD-10 mood disorders are shown in Table 3. Analysis of the data revealed that the recurrent depressive disorder was

Table 1. 1-month, 1-year and lifetime prevalence of mental disorders (ICD-10) among rural inhabitants of Udmurtia according to ICD-10/CIDI diagnoses

	1-month prevalence (ICD-10)		1-year prevalence (ICD-10)		Lifetime prevalence (ICD-10)	
ICD-10 diagnosis	%	SE	%	SE	%	SE
Severe depression	5.9	3.3	6.7	3.3	10.5	3.2
Moderate depression	9.9	3.2	11.2	3.2	17.2	3.1
Mild depression	11.5	3.2	12.6	3.2	15.1	3.2
Total mood disorders	27.3	2.9	30.5	2.8	42.8	2.6
Disorders due to use of alcohol	35.1	2.8	35.4	2.7	37.1	2.7
Alcohol dependence syndrome	30.3	2.9	30.4	2.9	31.9	2.8
Social phobias	44.2	2.6	44.2	2.6	45.6	2.5
Specific (isolated) phobias	2.5	3.4	2.3	3.2	2.7	3.4
Persistent somatoform pain disorder	10.3	3.2	10.4	3.2	10.4	3.2
Other diagnosis	1.2	3.4	1.2	3.4	1.4	3.4
No diagnosis of mental disorder	24.1	3.0	22.3	3.0	18.2	3.1

Table 2. Prevalence of depressive disorders (%) among rural inhabitants of Udmurtia according to sociodemographic factors

	12-month prevalence		Lifetime prevalence	
	%	SE	%	SE
Total	30.5	2.8	42.8	2.6
Gender				
Male	17.4	4.7	28.8	4.4
Female	40.5	3.5	53.4	3.1
P-value	***		***	
Age (years)				
18–29	35.7	5.4	43.8	5.0
30–39	25.8	5.1	41.1	4.5
40–49	27.2	5.9	41.8	5.3
50–65	37.0	6.7	46.4	6.2
P-value	*		NS	
Marital status				
Married	27.8	3.2	40.0	3.0
Widowed	68.8	9.9	75.0	8.8
Divorced	55.6	11.1	69.4	9.2
Never married	28.0	8.5	42.0	7.6
P-value	***		***	
Ethnicity				
Other	37.5	19.8	50.0	17.7
Russian	28.2	5.1	42.6	4.6
Udmurt	31.5	3.5	42.7	3.2
P-value	NS		NS	
Education				
Higher	30.0	8.4	50.0	7.1
Secondary	29.6	3.4	41.1	3.1
Lower secondary	34.7	6.7	44.9	6.1
P-value	NS		NS	
Social class				
Worker	27.1	4.9	37.0	4.3
Employee[a]	32.4	8.7	49.6	8.1
Retired	37.4	12.3	45.8	11.2
Unemployed	42.1	4.0	52.6	3.8
P-value	NS		**	

[a] White-collar workers.
* $P<0.05$, ** $P<0.01$, *** $P<0.001$.

most prevalent (12.4%) among both men (8.2%) and women (15.6%). The prevalence of depressive episode was lower, at 10.1% (4.9% for men and 14% for women). The rate for double depression was 3.9% (1.4% for men and 5.8% for women). Double depression has been defined as the concurrent presence of both dysthymia and depressive episodes, in which acute depressive episodes appear to be superimposed on the underlying chronic depression (14). The prevalence of 'pure dysthymia' was 4.1% (2.7% for men and 5.1% for women), and the prevalence of depressive disorders without dysthymia was 22.5% (13.1% for men and 29.6% for women). Bipolar disorder was a very rare diagnosis (only one case). The DSM-III-R 1-year rates for various mood disorders were 15.4% for major depression, 0.2% for bipolar disorder, 3.7% for double depression and 2.6% for 'pure dysthymia'.

Table 4 shows the incidence of depressive disorders (ICD-10) during the last year. In total, the annual incidence of depression was 75 per 1000. In men the annual incidence of depression was 41 per 1000 and in women it was 101 per 1000. According to severity of depression, the highest incidence (4%) was found for moderate depression, followed by severe depression (2%) and mild depression (1.5%). The highest incidence of depressive disorders was found in men aged 50 to 65 years (8.3%), and in women aged 18 to 29 years (19.3%). According to the DSM-III-R diagnostic criteria, the incidence of depressive disorders was 44 cases per 1000, which was considerably lower than that estimated by ICD-10 criteria.

There were also high lifetime prevalence rates for several other mental disorders: 45.6% for social phobias (F40.1; 52.0% in Udmurts, 33.3% in Russians, $P<0.001$), 37.1% for disorders due to use of alcohol (F10.1 and F10.2) and 10.4% for persistent somatoform pain disorder (F45.4). More than 75% of the respondents with lifetime depression

Table 3. 1-year prevalence of mood disorders (ICD-10) according to gender among the rural population of Udmurtia

Disorder	Both sexes		Men		Women		Sex ratio (female/male)
	%	SE	%	SE	%	SE	
Bipolar affective disorder	0.1	3.2	0.3	5.5	0	0	—
Recurrent depressive disorder	12.4	3.2	8.2	5.0	15.6	4.2	1.9
Depressive episode	10.1	3.2	4.9	5.0	14.0	4.2	2.9
Depressive episode with dysthymia (double depression)	2.6	3.4	0.8	5.1	3.9	4.4	4.9
Recurrent depressive disorder with dysthymia (double depression)	1.3	3.4	0.5	5.0	1.9	4.6	3.8
Total double depression	3.9	3.4	1.4	5.3	5.8	4.4	4.1
'Pure dysthymia'	4.1	3.4	2.7	5.1	5.1	4.4	1.9
Total depression	30.5	2.9	17.4	4.7	40.5	3.5	2.3
No mood disorder	69.4	1.9	82.6	2.2	59.6	2.9	—

Table 4. Incidence of depressive disorders (recurrent depressive disorder* and depressive episode) with onset within 12 months

	Both sexes		Men		Women	
	n	Incidence (%)	*n*	Incidence (%)	*n*	Incidence (%)
Age (years)						
18–29	30	13.4	4	4.5	26	19.3
30–39	18	6.3	4	3.6	14	7.9
40–49	7	3.4	2	1.8	5	5.2
50–65	9	6.5	5	8.3	4	5.1
Severity						
Severe	17	2.0	1	0.3	16	3.3
Moderate	34	4.0	9	2.4	25	5.1
Mild	13	1.5	5	1.4	8	1.7
Total	64	7.5	15	4.1	49	10.1

* Onset of the recurrent depressive disorder within the last 12 months.

had at least one other lifetime disorder. Social phobia was the most frequent concurrent disorder (54.4% from respondents with depression), followed by disorders due to use of alcohol (30.3%), persistent somatoform pain disorder (15.9%) and specific (isolated) phobias (3.3%). Comorbidity of depression with other disorders (Table 5) was statistically significant for social phobia and persistent somatoform pain disorder. The mean age of onset for social phobia was 7.1 years, and for persistent somatoform pain disorder it was 26.7 years. Analysis by gender and ethnicity demonstrated that comorbidity of depression with social phobia was statistically significant for the Udmurt men (58.3% had comorbid social phobia, odds ratio=2.09, 95% CI=1.15–3.81) and for the Udmurt women (62.6% had comorbid social phobia, odds ratio=1.65, 95% CI=1.04–2.62). Comorbidity of depression with persistent somatoform pain disorder was statistically significant for the Russian women (26.8% had comorbid somatoform pain disorder, odds ratio=2.66, 95% CI=1.02–7.11).

Table 2 shows that the 1-year prevalence of depression was higher in the 50 to 65 years (37.0%) and 18 to 29 years (35.7%) age groups. A higher than average prevalence of depression was found among the widowed (lifetime and 1-year rates, respectively, 75.0% and 68.8%) and divorced (69.4% and 55.6%, respectively) subjects. The lifetime prevalence of depression was 52.6% in currently unemployed subjects and 49.6% in employees. There were no associations between depression and ethnicity or between depression and educational level.

Of the respondents who described their family relationships as 'bad', 63.3% belonged to the depressive group; of the respondents who described them as 'satisfactory', 41.3% had depression, and of the respondents who described them as 'good', 37.1% belonged to the depressive group (χ^2=18.2, df=2, P<0.001). There were no associations between depression and income. The mean monthly income per family member in the families of subjects with depression was about $25.9, and in the families of subjects without depression it was $25.1. There were no significant differences in housing space per family member between subjects with and without depression (10 m^2 vs. 9 m^2).

Discussion

In the present study we have used the CIDI, which gives diagnoses simultaneously according to ICD-10 and DSM-III-R, covering 39 and 32 diagnoses, respectively, on Axis I. Although the analysis of the results was performed mainly according to the ICD-10 diagnoses, there are some statistics given for the DSM-III-R categories to make our results comparable to the data reported from other studies. According to the results of the present study, depression is a highly prevalent disorder among the rural population of Udmurtia. The lifetime prevalence of ICD-10 mood disorders of 42.8% in our study is more than twofold higher

Table 5. Comorbidity of depressive disorders (lifetime)

Comorbid disorder	Percentage of subjects with depressive disorders	Odds ratio	95% CI*
Alcohol abuse (F10.1)	30.3	0.60	0.44–0.80
Alcohol dependence (F10.2)	24.0	0.52	0.38–0.71
Social phobias (F40.1)	54.4	1.86	1.40–2.47
Specific (isolated) phobias (F40.2)	3.3	1.47	0.60–3.63
Persistent somatoform pain disorder (F45.4)	15.8	2.78	1.72–4.52
Other disorders	2.5	4.08	1.01–23.58
Any other disorder	74.0	1.34	0.98–1.83

* 95% CI, 95% confidence intervals.

than that reported in the majority of other community studies (1–5, 15, 16). However, according to the DSM-III-R diagnostic criteria, the lifetime prevalence of affective disorders in our study is considerably lower at 31.7%, which is close to the value of 35.4% obtained in the Zurich cohort study (6). Our results suggest that DSM-III-R diagnostic criteria for mood disorders are stricter and the number of cases of depression detected on the basis of DSM-III-R is lower than that according to ICD-10 criteria.

Our finding that the lifetime and 1-year rates of depression are higher in women is consistent with the results of many other studies (4, 7, 16–18). A high prevalence of depression among widowed, divorced and elderly subjects has been shown in Finland (16) and other countries (4, 17). Our study also confirms that depression is more common among widowed and divorced subjects. A higher lifetime prevalence of depression in unemployed people is also consistent with previous research findings (19). No age differences in the lifetime prevalence of depression were revealed, but the 1-year prevalence was higher in the youngest and oldest age groups. Notably, the highest risk of depression in our sample involved younger women and older men. There were no associations between depression and ethnicity either according to our findings, or in other studies (20, 21). Previous research on the relationships between depression and other socio-economic factors has yielded contradictory results (21, 22). Our study supports the finding of Romanoski et al. (21), that there is no association between depression and levels of income or education. However, it has to be borne in mind that the majority of the rural population in Udmurtia are on a low income.

The quality of close relationships, especially within the family, has been regarded as an important factor related to depression (22). Our study also supports the connection between depression and dissatisfaction with family relationships.

There was a higher prevalence of mild depression than of moderate and severe depression for the 1-month and 1-year periods, and these differences were expected. However, with regard to the lifetime rate, the cases of moderate depression were more prevalent. This may be explained by a tendency of the respondents to remember their previous moderate and severe depressive episodes better than their mild episodes. As assumed by Angst (1) and Giuffra and Risch (23), lifetime prevalence rates based on recall may greatly underestimate the true morbidity. Probably the incidence rate is also overestimated, due to the same bias of recall.

Depression has been found to be comorbid with many other mental disorders, particularly alcohol dependence (7, 10, 17, 24–26), eating disorders (10, 26) and anxiety disorders (4, 7, 10, 17, 27). No statistically significant association between depression and alcohol-related disorders was found in the present study. Our results showed a statistically significant relationship between depression and social phobia in Udmurts, and between depression and persistent somatoform pain disorder in the Russian women. It seems that depression is less strongly associated with ethnic background than comorbid disorders. Our findings show that the lifetime prevalence of social phobia in Udmurts is more than threefold higher than that reported in other studies (4, 28, 29). The onset of social phobia usually preceded the onset of depression, which is consistent with other studies (4). Thus the majority of cases of lifetime depressive disorders were seen in Udmurts with a past history of social phobia. A high level of comorbidity of affective disorders with social phobia was also obtained in the Munich Follow-up Study (4) and in some other studies (26, 28, 30). According to the ICD-10, social phobias are usually associated with low self-esteem and fear of criticism (31), and as noted by Beaudet (32), low self-esteem increases the odds of depression. As suggested by Weissman et al. (17), 'the differences in rates for major depression across countries suggest that cultural differences or different risk factors affect the expression of the disorder'. Social phobias could be the cultural feature of the Udmurts which increases the risk of depression, and this may partly explain the high rate of depression in Udmurtia.

According to our findings, only four subjects (two men and two women) with depressive disorders from the total of 366 subjects were seen by a psychiatrist, and the majority of the depressed patients remained unrecognized and untreated. This finding is consistent with the data obtained by Zung, which indicated that depression was an infrequent patient complaint, and the percentage of patients citing depression as a reason for their visit was 1.2% (1.1% in our study) of subjects with clinically significant depressive symptoms (33). Probably the majority of respondents with depression in our study did not realize the need for professional help. Wells et al. also suggest that doubt about the need for professional help was a common reason for not seeking care (34). Another reason is that the primary health care service is unable to detect cases of depression adequately (16, 35). It is notable that depression shows a strong comorbidity with social phobias, and therefore avoidance of social situations, including seeking professional help for depression, might have occurred. Thus our findings as well as those of Kessler et al. (18) show the importance of conducting

further research on barriers to professional help-seeking.

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References

1. Angst J. Epidemiology of depression. Psychopharmacology 1992: 106: S71–S74.
2. Weissman MM, Bruce ML, Leaf PJ, Florio LP, Holzer C. Affective disorders. In: Psychiatric disorders in America: the Epidemiologic Catchment Area Study. New York: Free Press, 1991: 53–80.
3. Henderson AS, Jorm AF, Mackinnon A. The prevalence of depressive disorders and the distribution of depressive symptoms in later life: a survey using draft ICD-10 and DSM-III-R. Psychol Med 1993: 23: 719–729.
4. Wittchen H-U, Essau CA, von Zerssen D, Krieg JC, Zaudig M. Lifetime and 6-month prevalence of mental disorders in the Munich Follow-up Study. Eur Arch Psychiatr Clin N Am 1992: 241: 247–258.
5. Wacker HR, Müllejans R, Klein KH et al. Identification of cases of anxiety disorders and affective disorders in the community according to ICD-10 and DSM-III-R by using the Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res 1992: 2: 91–100.
6. Angst J. The epidemiology of depressive disorders. Eur Neuropsychopharmacology 1995: 5 (Suppl.): 95–98.
7. Spaner D, Bland RC, Newman SC. Epidemiology of psychiatric disorders in Edmonton. Major depressive disorder. Acta Psychiatr Scand 1994: 89 (Suppl. 376): 7–15.
8. Wittchen H-U, Knäuper B, Kessler RC. Lifetime risk of depression. Br J Psychiatry 1994: 165 (Suppl. 26): 16–22.
9. Weissman MM, Klerman GL. Sex differences and the epidemiology of depression. Arch Gen Psychiatry 1977: 34: 98–111.
10. Keller MB. Diagnostic issues and clinical course of unipolar illness. In: Frances AT, Hales RE, ed. Review of psychiatry. Vol. 3. Washington, DC: American Psychiatric Press Inc., 1988.
11. Andersen SM, Harthorn BH. The recognition, diagnosis, and treatment of mental disorders by primary care physicians. Med Care 1989: 27: 869–886.
12. Horwath E, Johnson J, Klerman GL, Weissman MM. What are the public health implications of subclinical depressive symptoms? Psychiatr Quart 1994: 65: 323–337.
13. World Health Organization. Composite International Diagnostic Interview (CIDI). Geneva: World Health Organization, 1993.
14. Keller MB, Shapiro RW. 'Double depression': superimposition of acute depressive episodes on chronic depressive disorders. Am J Psychiatry 1982: 134: 438–442.
15. Carta MG, Carpiniello B, Kovess V, Porcedda R, Zedda A, Rudas N. Lifetime prevalence of major depression and dysthymia: results of a community survey in Sardinia. Eur Neuropsychopharmacology 1995: 5 (Suppl.): 103–107.
16. Salokangas RKR, Poutanen O, Stengård E, Jähi R, Palo-oja T. Prevalence of depression among patients seen in community health centres and community mental health centres. Acta Psychiatr Scand 1996: 93: 427–433.
17. Weissman MM, Bland RC, Canino GJ et al. Cross-national epidemiology of major depression and bipolar disorder. JAMA 1996: 276: 293–299.
18. Kessler RC, McGonage KA, Zhao S et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. Arch Gen Psychiatry 1994: 51: 8–19.
19. Potter LB, Rogler LH, Moscicki EK. Depression among Puerto Ricans in New York City: the Hispanic Health and Nutrition Examination Survey. Soc Psychiatry Psychiatr Epidemiol 1995: 30: 185–193.
20. Hirschfeld RMA. Major depression, dysthymia and depressive personality disorder. Br J Psychiatry 1994: 165 (Suppl. 26): 23–30.
21. Romanoski AJ, Folstein MF, Nestadt G et al. The epidemiology of psychiatrist-ascertained depression and DSM-III depressive disorders. Results from the Eastern Baltimore Mental Health Survey Clinical Reappraisal. Psychol Med 1992: 22: 629–655.
22. Coyne JC. Social factors and psychopathology: stress, social support, and coping processes. Annu Rev Psychol 1991: 42: 401–425.
23. Giuffra LA, Risch N. Diminished recall and the cohort effect of major depression: a simulation study. Psychol Med 1994: 24: 375–383.
24. Davidson KM. Diagnosis of depression in alcohol dependence: changes in prevalence with drinking status. Br J Psychiatry 1995: 166: 199–204.
25. Grant BF, Harford TC. Comorbidity between DSM-IV alcohol use disorders and major depression: results of a national survey. Drug Alcohol Depend 1995: 39: 197–206.
26. Alpert JE, Maddocks A, Rosenbaum JF, Fava M. Childhood psychopathology retrospectively assessed among adults with early-onset major depression. J Affect Dis 1994: 31: 165–171.
27. Ball SG, Buchwald AM, Waddell MT, Shekhar A. Depression and generalized anxiety symptoms in panic disorder. Implications for comorbidity. J Nerv Ment Dis 1995: 183: 304–308.
28. Judd LL. Social phobia: a clinical overview (review). J Clin Psychiatry 1994: 55 (Suppl. 6): 5–9.
29. Dick CL, Sowa B, Bland RC, Newman SC. Phobic disorders. Acta Psychiatr Scand 1994: 89 (Suppl. 376): 36–44.
30. Merikangas KR, Angst J. Comorbidity and social phobia: evidence from clinical, epidemiologic, and genetic studies (review). Eur Arch Psychiatr Clin N Am 1995: 244: 297–303.
31. World Health Organization. The ICD-10 Classification of Mental and Behavioural Disorders. Clinical descriptions and diagnostic guidelines. Geneva: World Health Organization, 1992.
32. Beaudet MP. Depression. Health Reports 1996: 7: 11–24.
33. Zung WW, Broadhead WE, Roth ME. Prevalence of depressive symptoms in primary care. J Fam Pract 1993: 37: 337–344.
34. Wells JE, Robins LN, Bushnell JA, Jarosz D, Oakley-Browne MA. Perceived barriers to care in St Louis (USA) and Christchurch (NZ): reasons for not seeking professional help for psychological distress. Soc Psychiatry Psychiatr Epidemiol 1994: 29: 155–164.
35. Salokangas RKR, Poutanen O, Stengård E. Screening for depression in primary care. Development and validation of the Depression Scale, a screening instrument for depression. Acta Psychiatr Scand 1995: 92: 10–16.

IV

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Research report

Symptoms of depression in the Estonian population: prevalence, sociodemographic correlates and social adjustment

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Abstract

Objective: The current study presents data on the prevalence of depressive symptoms in the Estonian population and examines associated sociodemographic factors and subjective aspects of social adjustment. *Method*: The data came from the Estonian Health Interview Survey where 4711 persons aged 15–79 were interviewed. This study included 4677 respondents who answered the Emotional State Questionnaire (EST-Q), a self-rating scale of depression and anxiety. Data on the sociodemographic factors and domains of social adjustment were derived from structured interviews. *Results*: Depressive symptoms were observed in 11.1% of the respondents. Depressiveness was more common among women, in older age groups, among those not married, in ethnic groups other than Estonians, in lower income groups, and among the unemployed and economically inactive respondents. Depressive subjects were less satisfied, had a more pessimistic prognosis about the future and lower self-rated health. A low level of perceived control was a significant correlate of depression. The association of depressiveness with poor subjective social adjustment remained significant even after controlling for objective circumstances. *Limitations:* Depression was identified by a self-rate questionnaire, therefore results can not be generalized to clinical depression without caution. *Conclusion:* Depressive symptoms in the Estonian population were strongly related to socioeconomic functioning. Results emphasize that subjective social adjustment and perceived control are important characteristics of depression and should be considered in assessment and treatment. © 2002 Published by Elsevier Science B.V.

Keywords: Depression; Social adjustment; Control; Socioeconomic factors

1. Introduction

Mood disorders are among the most frequent mental disorders in the general population (Kessler et al., 1994). A recent pan-European study (DE-

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PRES) showed that the 6-month prevalence of major depression ranged from 3.8 to 9.9% in different countries and subsyndromal depressive symptoms were even more common (Lépine et al., 1997). Studies of the correlates of depression have yielded varying results but nearly always a higher prevalence of depression is found in women and a negative association with some indicator of socioeconomic status is observed (Blazer et al., 1994; Kessler et al., 1997). Apart from its frequent occurrence, depression is a highly disabling condition (Judd et al., 1996; Kessler et al., 1997; Lecrubier, 2000). In understanding motivational and functional impairment in depression the concepts of social adjustment and social functioning have been used interchangeably (Hirschfeld et al., 2000; Weissman, 2000). Social adjustment encompasses objective and subjective role performance in the main areas of life, such as work, economic situation, family, leisure and relationships (Hirschfeld et al., 2000; Weissman, 2000; Bosc, 2000). Objective adjustment includes indices of a sociodemographic nature, namely income, occupation, education, marital status, as well as more specific data about role functioning. Subjective adjustment is defined in terms of the satisfaction, enjoyment and interest people derive from their role performance and relationships. Recent studies have borrowed ideas from cognitive and interpersonal theories of depression stressing the role of relationships and sense of control (Bosc, 2000). This is a logical sequel to studies showing that different health problems including depression are related to low self-efficacy, a low sense of control and pessimistic attitudes (Seligman, 1975; Beck, 1976; Rodin and Salovey, 1989).

Interest in social adjustment has arisen from the necessity of assessing the consequences of depression and differentiating the efficacy of treatments. Depressed subjects have shown marked impairment in social adjustment in both the short-term and long-term perspectives (Thornicroft and Sartorius, 1993). Depression affects the individual's quality of life and impairs functioning more than any anxiety disorder, and as much as the most common medical conditions (Wells et al., 1989; Ormel et al., 1994).

One reason for undertaking the present study was the great social and economic differentiation that emerged in Estonian society during the 1990s. A recent study of general self-rated health showed that health resources are not equally distributed amongst the Estonian population (Leinsalu, 2002). We suggest that greater social variability also affects the distribution of mental disorders in the population, thus presenting a unique possibility for studying the relationship of depression with socioeconomic correlates and subjective adjustment. The aim of the study was to investigate the prevalence of depressive symptoms in the general population in Estonia during the mid 1990s, and to analyze the relationship of depressiveness with sociodemographic indicators and subjective aspects of social adjustment.

2. Material and methods

2.1. Procedure and subjects

The study is part of the Estonian Health Interview Survey (EHIS), a population based survey of health, health-related behaviours and background factors (Leinsalu et al., 1998). The survey, which consisted of face-to-face structured interviews, was carried out in 1996–1997. The multistage random sample of individuals was drawn from the 1989 census dataset. Persons aged 15–64 were sampled in proportion to their sex and age composition in the sampling unit; persons aged over 65 were over-sampled. Using the following weights: 0.33 for the 75–79 age group, 0.5 (70–74 years), 0.66 (65–69 years) and 1.00 for the rest of the sample, the sample was representative of the Estonian population. In all, 6019 subjects in the age range 15–79 were selected for interview, where the response rate was 78.3% ($n = 4711$). The design and the sampling procedure of the survey are described in more detail elsewhere (Leinsalu et al., 1998). This study included those 4677 respondents (2111 men and 2566 women), who also completed the Emotional State Questionnaire (EST-Q), a self-rating scale developed for the screening of depression and anxiety (Aluoja et al., 1999). The number of non-responders to the EST-Q was 34 consisting mainly of those subjects who were unable to answer the questionnaire due to their poor mental or general health state.

2.2. Measures

Sociodemographic data and indices of social adjustment were derived from the structured interviews. Income denotes the average monthly income in Estonian kroons per household member in the previous 12 months, where the household equivalence scales 1; 0.8; 0.8 were used (United Nations Development Program, 1999). Quartiles of income were used to divide respondents into four groups. Occupational status was determined by the current or last occupation of respondents.

Domains of subjective functioning were sense of control, self-rated health, perception of the future, perceived social support and satisfaction in nine areas. The nine areas covered work, career, financial situation, leisure, family life, life as a whole, trusting relationships, emotional and intimate relationships with a partner, and relationships with children. A 4-point rating scale ranging from 1 (satisfied) to 4 (not at all satisfied) was used. Self-rated health was measured by the question: "Overall, how do you evaluate your health status?" Interviewers scored the answers on a 5-point scale from 1 (very good) to 5 (very bad). Perceived social support was assessed via the scope of relationships, derived from the question: "Who are those you can really trust when you need help?" Answers were categorized as: no trusting relationships, only persons outside the family, only persons within the family or relatives, and persons both inside and outside the family. Perception of the future was based on expectations of positive life changes in the immediate future: better opportunities for education, more chances of getting a job, better assistance to the disadvantaged, more professional medical aid, decreasing criminality and increasing personal income. The items were scored from 1 (yes, certainly) to 5 (certainly not). A sum score for six items was used with a higher score indicating a more negative perception of the future. Perceived control was defined as a general belief about having influence over the course of one's personal life. Three items, two of them from the Rotter I-E scale were used (Rotter, 1966). The items concerned a general sense of control over personal life, control over the realization of one's plans and taking the initiative or leaving it to others. Each item contained two alternative statements indicating either a high or low sense of control. Respondents were divided into three groups for further analysis. Groups with an extremely high or low sense of control were formed from subjects who chose only high-control or low-control statements on all three items, respondents who had used both kinds of answer formed a moderate-control group.

Depressiveness was assessed by using the EST-Q Depression subscale, reflecting symptoms of depressive disorder according to ICD-10 and DSM-IV during the previous 4 weeks. The eight items concerning sadness, loss of interest, worthlessness, hopelessness, self-accusations, thoughts of suicide, feelings of loneliness, and impossibility of enjoyment were rated on a 0–4 scale. Respondents were divided into depressive and non-depressive groups with a cut-off score of 12. This score correctly identified 91.1% of patients with the ICD-10 clinical diagnosis of a depressive episode and 88.1% of the healthy subjects.

2.3. Data analysis

Between-group comparisons for continuous data (satisfaction, predictions of the future, self-rated health) were computed using one-way analysis of variance (ANOVA). An initial analysis was performed with depression as an independent factor for each dependent variable and then the sociodemographic indices were added as additional factors to control for their effect on satisfaction and predictions of the future. Logistic regression was used to assess the relationship of sociodemographic variables, sense of control and scope of relationships with the symptoms of depression. Model 1 was calculated by taking each correlate one at a time, adjusting all variables for only sex and age. Model 2 was adjusted simultaneously for all sociodemographic factors. The results are reported as odds ratios (OR) with 95% confidence intervals (CI). Marital status, ethnicity, income and economic activity were force-entered into the model to test which variables were responsible for the effect of education and occupation. The SPSS and EPI-INFO statistical packages were used for the data analysis.

Table 1
Description of the sample and association of depressive symptoms with sociodemographic factors, perceived control and scope of relationships with results from logistic regression[a]

Correlate	Sample size	Percentage in	Percentage with	Model 1[b]		Model 2[b]	
	(*n*)	the sample[c]	depressive symptoms[c]	OR	CI (95%)	OR	CI (95%)
Total	4677	100.0	11.1	–	–	–	–
Sex							
Men	2111	46.9	6.7	1.00		1.00	
Women	2566	53.1	14.9	2.31	1.90–2.81	2.03	1.61–2.55
Age							
15–19	360	8.9	9.2	1.57	0.97–2.54	1.00	0.48–1.81
20–29	657	16.2	6.1	1.00		1.00	
30–39	739	18.3	8.8	1.48	0.98–2.24	1.51	0.98–2.33
40–49	713	17.6	11.2	1.92	1.29–2.85	1.95	1.28–2.98
50–59	627	15.5	11.3	1.95	1.30–2.92	1.98	1.28–3.07
60–69	795	15.3	13.7	2.53	1.73–3.69	1.67	1.04–2.67
70–79	786	8.2	22.3	3.89	2.70–5.60	2.36	1.46–3.81
Marital status							
Married/cohabiting	2777	61.9	8.2	1.00		1.00	
Never married	737	17.3	10.3	1.77	1.33–2.36	1.70	1.21–2.39
Widowed	615	9.0	22.4	1.74	1.35–2.26	1.62	1.23–2.13
Divorced/separated	548	11.8	18.6	2.02	1.56–2.61	1.94	1.49–2.53
Ethnicity							
Estonian	3107	65.9	9.1	1.00		1.00	
Russian	1232	26.9	15.3	1.85	1.53–2.25	1.81	1.45–2.25
Other	338	7.2	13.0	1.71	1.24–2.37	1.67	1.18–2.35
Urban/rural residence							
Urban	3324	71.5	11.3	1.00		1.00	
Rural	1353	28.5	10.4	0.90	0.74–1.10	1.04	0.82–1.32
Education							
University	600	13.5	8.4	1.00		1.00	
Upper secondary	2361	54.5	9.8	1.34	0.98–1.84	0.96	0.75–1.22
Lower secondary or less	1715	32.0	14.3	1.66	1.21–2.29	1.06	0.67–1.69
Income							
1st Quartile (0–916)	1132	24.5	14.7	2.23	1.68–2.97	1.43	1.03–1.97
2nd Quartile (917–1175)	1166	22.0	15.6	2.16	1.62–2.89	1.63	1.18–2.24
3rd Quartile (1176–1763)	1159	25.5	8.6	1.27	0.93–1.73	1.07	0.77–1.47
4th Quartile (1764–20000)	1157	27.9	6.4	1.00		1.00	
Economic activity							
Employed/self-employed	2394	58.2	7.5	1.00		1.00	
Unemployed	289	7.1	17.3	2.99	1.85–3.66	2.26	1.56–3.28
Economically non-active	1994	34.7	15.8	1.74	2.20–3.22	1.59	1.15–2.21

Table 1. Continued

Correlate	Sample size (*n*)	Percentage in the sample[c]	Percentage with depressive symptoms[c]	Model 1[b] OR	Model 1[b] CI (95%)	Model 2[b] OR	Model 2[b] CI (95%)
Current/last occupation							
Manager/high professional	696	15.5	7.7	1.0		1.00	
Associate professional	647	14.0	11.3	1.28	0.89–1.84	1.15	0.73–1.81
Clerk/service, sales worker	673	14.6	12.2	1.42	1.00–2.03	1.27	0.81–2.00
Agricultural worker	291	5.5	12.5	1.41	0.92–2.16	1.23	0.72–2.11
Skilled worker	901	19.6	10.5	1.79	1.26–2.53	1.39	0.88–2.19
Machine operator/unskilled	1196	24.2	12.8	1.67	1.21–2.30	1.24	0.78–1.92
Never worked	272	6.6	10.8	2.50	1.51–4.14	1.27	0.58–2.75
Perceived control							
High	1324	30.1	4.2	1.00		1.00	
Moderate	2727	58.6	12.3	2.90	2.18–3.86	2.51	1.88–3.37
Low	598	11.2	23.0	5.35	3.85–7.44	4.34	3.09–6.10
Scope of relationships							
No trusting relationships	249	5.1	27.3	3.75	2.61–5.39	2.62	1.78–3.84
Only outside family	289	6.4	17.8	2.25	1.55–3.29	2.25	1.22–2.66
Only within family	3149	66.4	10.1	1.07	0.83–1.38	1.00	0.76–1.30
Both in and outside family	968	22.5	8.5	1.00		1.00	

[a] Results are reported as odds ratios (OR) with 95% confidence intervals (CI).

[b] Two regression models are presented: model 1 with adjustment of all variables for sex and age and model 2 with mutual adjustment for sex, age, marital status, ethnicity, residence, education, income, economic activity and occupation.

[c] The following weights were used: 0.33 (75–79 years), 0.5 (70–74 years), 0.66 (65–69 years), 1.00 (age 15–64 years), to correspond to the population distribution in Estonia.

3. Results

A general description of the sample is presented in Table 1. The results indicate that 11.1% (weighted by age, S.E. 0.5) of the Estonian population had suffered from significant depressive symptoms during the previous 4 weeks. Depression was more common in women (14.9%, S.E. 1.8) than in men (6.7%, S.E. 1.8).

Table 1 presents the association of depression with sociodemographic factors, sense of control and scope of relationships. According to model 1, the odds of having depressive symptoms were higher in those who were older, in the never married, in the divorced and widowed, in ethnic groups other than Estonians, in the unemployed and in economically inactive groups (which consisted mostly of pensioners but also included students and other non-working groups). Low socioeconomic status (measured by the level of education, income or occupation) was related to depression in the first model. However, when adjusted for the other sociodemographic variables in model 2, the effect of education and occupation disappeared. When the variables were force-entered into the regression model one by one, the adjustment for income and economic activity appeared to be crucial. Urban/rural residence was not related to depression neither in the first, nor in the adjusted model. A significantly higher occurrence of depressive symptoms was observed in subjects with a low and moderate sense of control compared to subjects with a high sense of control. Subjects with no relationships or with relationships only outside the family had a higher occurrence of depressiveness than the reference group with relationships both in- and outside the family or the group with relationships only within the family.

Table 2 shows the mean scores of satisfaction, self-rated health and prognosis about the future in the non-depressive and depressive groups. The ANOVA revealed that depressive subjects had significantly less satisfaction in all areas of life, in trusting relationships and in relationships with their partners and children. Depressives also had a more pessimis-

Table 2
Mean scores of satisfaction, self-rated health and perception of the future in non-depressive and depressive subjects: results of ANOVA

	Non-depressive, mean (S.D.)	Depressive, mean (S.D.)	Depressive versus non-depressive, F (df)	P
Satisfaction				
Job	1.6 (0.8)	2.0 (0.9)	23.48[a] (1,2324)	<0.001
Career	2.0 (0.9)	2.6 (1.0)	43.63[b] (1,4259)	<0.001
Family life	1.6 (0.8)	2.3 (1.1)	106.87[c] (1,4239)	<0.001
Economic situation	2.4 (1.0)	3.1 (0.9)	59.06[b] (1,4349)	<0.001
Leisure	2.0 (0.9)	2.6 (1.0)	88.01[c] (1,4304)	<0.001
Life in general	1.8 (0.8)	2.7 (0.9)	203.65[c] (1,4318)	<0.001
All trusting relationships	1.6 (0.8)	2.2 (1.1)	79.45[d] (1,3897)	<0.001
Emotional with partner	1.3 (0.5)	1.7 (0.5)	28.91[c] (1,2611)	<0.001
Intimate with partner	1.4 (0.9)	1.8 (0.9)	14.59[c] (1,2611)	<0.001
With children	1.2 (0.7)	1.4 (0.7)	1.73[c] (1,2375)	n.s.
Perception of the future	18.6 (4.5)	20.3 (4.9)	12.77[c] (1,4271)	<0.001
Self-rated health	2.6 (0.8)	3.3 (0.8)	65.32[c] (1,4329)	<0.001

[a] Controlled for age, sex, occupation and income.
[b] Controlled for age, sex, occupation, income and economic activity.
[c] Controlled for age, sex, income, economic activity, ethnicity and marital status.
[d] Controlled for age, sex, income, economic activity, ethnicity, marital status and scope of relationships.

tic prognosis about the future and lower self-rated health. When multifactorial ANOVA controlling for sex, age and possible satisfaction-relevant objective life circumstances was performed, all the differences between the depressive and non-depressive groups remained significant, except satisfaction with relationships with children.

4. Discussion

Our study showed that in Estonia the 4-week prevalence of significant depressive symptoms (comparable in severity to major depression) was 11.1%, which is higher than the 1-month prevalence of major depression found in population studies based on structured interviews (Blazer et al., 1994; Murphy et al., 2000). As a self-rate instrument, the EST-Q identifies not only respondents with major depression but also those with depressive reactions. Thus, the obtained prevalence of depressiveness is a very rough estimate of depression in Estonia and can not be directly compared to results from studies using structured psychiatric interviews.

The odds of having depressive symptoms were two times higher in women than in men, which is similar to other results obtained in different population studies (Blazer et al., 1994; Lépine et al., 1997). Our study revealed a significantly higher risk of depressive symptoms above age 40. There is no consensus regarding the relationship between depression and age. While the prevalence of major depression has been found to decrease with age (Blazer et al., 1994; Isometsä et al., 1997; Murphy et al., 2000), depressive symptoms have shown some positive association with age (Lépine et al., 1997; Salokangas and Poutanen, 1998). Our results support the idea that major depression and depressive symptoms could have different relationships to age. The current study showed a strong relationship between depressiveness and economic factors, such as employment status and income, while other studies have found a higher rate of depression only in the lowest income group or no differences at all (Kessler et al., 1994; Isometsä et al., 1997; Pakriev et al., 1998). In accordance with previous studies, we found unemployment, as an indicator of economic insecurity to be related to depression (Kessler et al., 1997; Lépine et al., 1997). Economic factors were also responsible for the higher occurrence of depressive symptoms in lower education groups and amongst some occupation types. The relationship of depressiveness with a lack of marital relationship was an expected result (Blazer et al., 1994; Salokangas et al., 1998). The

higher prevalence of depressive symptoms in non-Estonian subjects was an interesting result, which could not be explained by social and economic differences. We may only speculate that non-Estonians were exposed to additional stressors during the transition, like problems with speaking and understanding the official language (Estonian) and uncertainties concerning their position in society. Many ethnic non-Estonians also lost their usual social support network. The strong relationship between depressive symptoms and sociodemographic factors found in our study might have been the result of rapid differentiation of the population during the political and economic transition in Estonia in comparison with more stable societies. East–West differences have been reported for self-rated health (Carlson, 1998) and it is highly probable that similar mechanisms affect the prevalence and social distribution of depressiveness.

Depressive respondents had considerably poorer subjective social adjustment than respondents with a normal mood state which has been a universal finding in previous studies (Wells et al., 1989; Judd et al., 1996; Pyne et al., 1997). They reported lower self-rated health and experienced less satisfaction in most important areas of their lives. The low subjective rating of health is a frequent indicator of impairment associated with depression (Judd et al., 1996). Our study accords with findings that satisfaction and enjoyment are strongly related to depressiveness (Ritsner et al., 2000; Koivumaa-Honkanen et al., 2001). It is noteworthy that the relationship with depressiveness remained considerable even after controlling for objective life circumstances. The results are in accordance with the cognitive model of depression indicating that depressed subjects view their present life as being empty of gratification and have pessimistic views regarding the future (Beck, 1976). Although less satisfied, depressive subjects also exhibited less perceived control. This is in line with studies stressing the role of low perceived control in depression either as an independent factor or a mediator of socioeconomic circumstances and social support (Evans, 1981; Mirowsky and Ross, 1990; Landau, 1995). A combination of hopelessness and uncontrollability has been regarded as the major cognitive correlate of depressive symptoms (Abramson et al., 1989). Our results suggest a vicious circle is maintaining depression. If dissatisfaction is combined with negative beliefs about control and less hope of anything changing for the better, it leads to low levels of activity and fewer attempts to change the situation, i.e. poor social adjustment, which in its turn, confirms negative cognitions and helplessness, thus maintaining depression. Other authors have proposed similar cognitive-motivational-emotional cycles (Lewinsohn, 1974; Kanfer and Hagerman, 1981). Findings that a low level of social functioning was not only a consequence of depression but also an important risk factor for earlier recurrences and chronicity (Staner et al., 1997) support the vicious circle model.

This study confirms the important role of relationships in depression. The total absence of trusting relationships and a lack of relationships with family members were strong predictors of depression. This suggests that the family is a more important source of social support than relationships outside the family, confirming the findings that depression is most related to disruptions in family/partner relationships (Fredman et al., 1988; Zlotnick et al., 2000). Not having an intimate tie has been found to be an important mediator between low social position and depression (Brown and Harris, 1978). Depressed subjects were dissatisfied with most close relationships even when the quantitative aspects, such as marital status and the scope of relationships were controlled for. This emphasizes the importance of subjective functioning in depression, especially when it is noted that from several aspects of social support, subjective satisfaction is the best outcome predictor for depression (Ezquiaga et al., 1999).

Some limitations of our study should be noted. Firstly, our depressive sample was identified by a self-rated measure. Although the cut-off point of the EST-Q depression subscale was chosen high enough to identify cases that were equivalent to major depression in symptomatic severity, the prevalence of depressive symptoms obtained in our study can not be directly compared to surveys based on structured diagnostic interviews. Nevertheless, the symptom structure of depression identified with self-rate measures has been shown to resemble depression (Cox et al., 1999), and impaired social functioning has been found in subsyndromal depression (Judd et al., 1996). Secondly, the EHIS was not

specifically designed to assess the whole range of social adjustment, and therefore only certain aspects of it could be addressed. The cross-sectional design of the study prevents any conclusions about causal relationships between depressive symptoms and social adjustment.

In summary, this study indicates that depressive symptoms in the Estonian population have a high prevalence and strong relationship with sociodemographic factors, with a similar pattern to those seen in other population studies. The important factor in depression is subjective functioning: the experience of satisfaction and control has a strong relationship with depression despite objective circumstances. These results point to the idea that social adjustment ought to be considered an important aspect in the assessment of depression and its outcome.

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References

Abramson, L.Y., Metalsky, G.I., Alloy, L.B., 1989. The hopelessness theory of depression: a theory-based subtype of depression. Psychol. Rev. 96, 358–372.

Aluoja, A., Shlik, J., Vasar, V., Luuk, K., Leinsalu, M., 1999. Development and psychometric properties of the Emotional State Questionnaire, a self-report questionnaire for depression and anxiety. Nord. J. Psychiatry 53, 443–449.

Beck, A.T., 1976. Cognitive Therapy and the Emotional Disorders. International Universities Press, New York.

Blazer, D.G., Kessler, R.C., McGonagle, K.A., Swartz, M.S., 1994. The prevalence and distribution of major depression in a national community sample: the National Comorbidity Survey. Am. J. Psychiatry 151, 979–986.

Bosc, M., 2000. Assessment of social functioning in depression. Compr. Psychiatry 41, 63–69.

Brown, G.W., Harris, T., 1978. Social Origins of Depression. A Study of Psychiatric Disorder in Women. Tavistock, London.

Carlson, P., 1998. Self-perceived health in East and West Europe: another European health divide. Soc. Sci. Med. 46, 1355–1366.

Cox, B.J., Enns, M.W., Borger, S.C., Parker, J.D.A., 1999. The nature of the depressive experience in analogue and clinically depressed samples. Behav. Res. Ther. 37, 15–24.

Evans, R.G., 1981. The relationships of two measures of perceived control to depression. J. Pers. Assess. 45, 66–70.

Ezquiaga, E., Garcia, A., Pallares, T., Bravo, M.F., 1999. Psychosocial predictors of outcome in major depression: a prospective 12-month study. J. Affect. Disord. 52, 209–216.

Fredman, L., Weissman, M.M., Leaf, P.J., Bruce, M.L., 1988. Social functioning in community residents with depression and other psychiatric disorders: results of the New Haven Epidemiologic Catchment Area Study. J. Affect. Disord. 15, 103–112.

Hirschfeld, R.M., Montgomery, S.A., Keller, M.B., Kasper, S., Schatzberg, A.F., Moller, H.J., Healy, D., Baldwin, D., Humble, M., Versiani, M., Montenegro, R., Bourgeois, M., 2000. Social functioning in depression: a review. J. Clin. Psychiatry 61, 268–275.

Isometsä, E., Aro, S., Aro, H., 1997. Depression in Finland: a computer assisted telephone interview study. Acta Psychiatr. Scand. 96, 122–128.

Judd, L.L., Paulus, M.P., Wells, K.B., Rapaport, M.H., 1996. Socioeconomic burden of subsyndromal depressive symptoms and major depression in a sample of the general population. Am. J. Psychiatry 153, 1411–1417.

Kanfer, H.K., Hagerman, S., 1981. The role of self-regulation. In: Rehm, L.P. (Ed.), Behaviour Therapy For Depression. Present Status and Future Directions. Academic Press, New York, pp. 143–179.

Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen, H.U., Kendler, K.S., 1994. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. Arch. Gen. Psychiatry 51, 8–19.

Kessler, R.C., Zhao, S., Blazer, D.G., Swartz, M., 1997. Prevalence, correlates, and course of minor depression and major depression in the National Comorbidity Survey. J. Affect. Disord. 45, 19–30.

Koivumaa-Honkanen, H., Honkanen, R., Antikainen, R., Hintikka, J., Laukkanen, E., Honkalampi, K., Viinamaki, H., 2001. Self-reported life satisfaction and recovery from depression in a 1-year prospective study. Acta Psychiatr. Scand. 103, 38–44.

Landau, R., 1995. Locus of control and socioeconomic status: does internal locus of control reflect real resources and opportunities or personal coping abilities? Soc. Sci. Med. 41, 1499–1505.

Lecrubier, Y., 2000. Depressive illness and disability. Eur. Neuropsychopharmacol. 10 (Suppl. 4), 439–443.

Leinsalu, M., 2002. Social variation in self-rated health in Estonia: a cross-sectional study. Soc. Sci. Med. (in press).

Leinsalu, M., Grintsak, M., Noorkõiv, R., Silver, B., 1998. Estonian Health Interview Survey. Methodological Report. Institute of Experimental and Clinical Medicine, Tallinn.

Lépine, J.P., Gastpar, M., Mendlewicz, J., Tylee, A., 1997. Depression in the community: the first pan-European study DEPRES (Depression Research in European Society). Int. Clin. Psychopharmacol. 12, 19–29.

Lewinsohn, P.M., 1974. A behavioural approach to depression. In:

Friedman, R.J., Katz, M.M. (Eds.), The Psychology of Depression: Contemporary Theory and Research. Wiley, New York, pp. 157–185.
Mirowsky, J., Ross, C.E., 1990. Control or defense? Depression and the sense of control over good and bad outcomes. J. Health Soc. Behav. 31, 71–86.
Murphy, J.M., Laird, N.M., Monson, R.R., Sobol, A.M., Leighton, A.H., 2000. A 40-year perspective on the prevalence of depression: the Stirling County Study. Arch. Gen. Psychiatry 57, 209–215.
Pakriev, S., Vasar, V., Aluoja, A., Saarma, M., Shlik, J., 1998. Prevalence of mood disorders in the rural population of Udmurtia. Acta Psychiatr. Scand. 97, 169–174.
Pyne, J.M., Patterson, T.L., Kaplan, R.M., Gillin, J.C., Koch, W.L., Grant, I., 1997. Assessment of the quality of life of patients with major depression. Psychiatr. Serv. 48, 224–230.
Ritsner, M., Modai, I., Endicott, J., Rivkin, O., Nechamkin, Y., Barak, P., Goldin, V., Ponizovsky, A., 2000. Differences in quality of life domains and psychopathologic and psychosocial factors in psychiatric patients. J. Clin. Psychiatry 61, 880–889.
Rodin, J., Salovey, P., 1989. Health psychology. Annu. Rev. Psychol. 40, 533–579.
Rotter, J.B., 1966. Generalized expectancies for internal versus external control of reinforcement. Psychol. Monogr. 80, 1–28.
Salokangas, R.K., Poutanen, O., 1998. Risk factors for depression in primary care. Findings of the TADEP project. J. Affect. Disord. 48, 171–180.
Seligman, M.E.P., 1975. Helplessness: on depression, development, and death. W.H. Freeman, San Francisco, CA.
Staner, L., Tracy, A., Dramaix, M., Genevrois, C., Vanderelst, M., Vilane, A., Bauwens, F., Pardoen, D., Mendlewicz, J., 1997. Clinical and psychosocial predictors of recurrence in recovered bipolar and unipolar depressives: a 1-year controlled prospective study. Psychiatry Res. 69, 39–51.
Thornicroft, G., Sartorius, N., 1993. The course and outcome of depression in different cultures: 10-year follow-up of the WHO collaborative study on the assessment of depressive disorders. Psychol. Med. 23, 1023–1032.
United Nations Development Program, 1999. Poverty Reduction in Estonia. UNDP, Tartu.
Weissman, M.M., 2000. Social functioning and the treatment of depression. J. Clin. Psychiatry 61 (Suppl. 1), 33–38.
Wells, K.B., Stewart, A., Hays, R.D., 1989. The functioning and well-being of depressed patients. Results from the medical outcome study. J. Am. Med. Assoc. 262, 914–919.
Zlotnick, C., Kohn, R., Keitner, G., Della Grotta, S.A., 2000. The relationship between quality of interpersonal relationships and major depressive disorder: findings from the National Comorbidity Survey. J. Affect. Disord. 59, 205–215.

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