

ANNE KLEINBERG

Major depression in Estonia:
prevalence, associated factors, and
use of health services



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Department of Psychiatry, University of Tartu, Estonia

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Supervisors: Professor Veiko Vasar, MD, PhD
Department of Psychiatry, University of Tartu, Estonia

Senior Lecturer Anu Aluoja, PhD
Department of Psychiatry, University of Tartu, Estonia

Reviewers: Professor Anneli Uusküla, MD, PhD
Department of Public Health

Professor Ruth Kalda, MD, PhD
Department of Polyclinic and Family Medicine

Opponent: Professor Raimo KR Salokangas, MD, PhD, MSc
Department of Psychiatry, University of Turku

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LIST OF ORIGINAL PUBLICATIONS

This thesis is based on the following original publications, which are referred to in the text by Roman numerals I–III.

- I Kleinberg A, Aluoja A, Vasar V. Point prevalence of major depression in Estonia. Results from the 2006 Estonian Health Survey. *European Psychiatry* 2010; 25 (8): 485–490.
- II Kleinberg A, Aluoja A, Vasar V. Help-seeking for emotional problems in major depression. Findings of the 2006 Estonian Health Survey. *Community Mental Health Journal*. 2012 Feb 4.
- III Kleinberg, A, Aluoja A, Vasar V. Social support in depression: structural and functional factors, perceived control, and help-seeking. *Epidemiology and Psychiatric Sciences* 2013; 24: 1–9.

Author's contribution to original publications:

I–III The author participated in the study design as member of the Scientific Board of EHIS-2006, analysed the data, and prepared the manuscript.

ABBREVIATIONS

| | |
|--------|---|
| CI | confidence intervals |
| CMDD | chronic major depressive disorder |
| CSD | chronic somatic disorder |
| DSM-IV | Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition |
| EHIS | 2006 Estonian Health Interview Survey |
| ESCR | emotional satisfaction with couple relations |
| FCP | frequency of contacts with parents |
| GP | general practitioner |
| HDI | Human Development Index (HDI) |
| IHDI | Inequality-adjusted Human Development Index |
| LOC | locus of control |
| MDE | major depressive episode |
| MDD | major depressive disorder |
| MINI | Mini-International Neuropsychiatric Interview |
| NS | not significant |
| ODIN | study the European Outcome of Depression International Network study |
| OR | odds ratio |
| SPSS | Statistical Package for the Social Sciences for the Windows |
| WHO | World Health Organisation |

I. INTRODUCTION

Mental disorders are among the most burdensome of all classes of disease because of their high prevalence, chronicity, and resulting serious impairment (WHO, 2000). An important reason for the adverse course is that people are not willing to seek help for their mental health problems – only about one-quarter of persons with mental health problems seek for help (Bijl and Ravelli, 2000; Alonso et al., 2004). Despite the increase in help-seeking for emotional problems (Mojtabai, 2007), people tend not to use specialized help (Svensson et al., 2009), and different countries reveal significant variability in help-seeking (Wang et al., 2005; ten Have et al., 2005).

Negative attitude toward help-seeking for mental illness or emotional problems is a rather common phenomenon (Jagdeo et al., 2009; ten Have et al., 2010) and is associated with several objective and non-objective problems. Usually, people simply do not recognize mental disorders (Jorm et al., 1997); they believe that professional help will not make any difference (Sareen, et al., 2007; ten Have et al., 2010), or they are afraid of stigmatization (Sareen, et al., 2007; ten Have et al., 2010). People would like to solve their problems on their own (Kessler et al., 2001; Sareen et al., 2007). The need to seek help has been found to be increasing when psychosocial functioning due to a mental disorder is decreasing (Bijl and Ravelli, 2000; Hämäläinen et al., 2008).

Depression is one of the most important mental health problems with severe symptoms and impaired cognitive and social functioning (Kessler et al., 2003; Bromet et al., 2011) leading to decreased performance in the workplace and elsewhere (Lepine et al., 2011). Still, many depressed patients receive either no treatment at all, or the treatment is inadequate (Angst, 1997; Hämäläinen et al., 2008). Concern about adequate diagnosis and insufficient treatment of depression is actual (Kessler et al., 2003; Wang et al., 2005; Kessler et al., 2007), and more data are needed about depression treatment (Paykel et al., 2005). One reason for the recent interest in depression is that inadequate depression treatment and frequent hospitalizations cause an increase in health care costs (Oslin et al., 2002; Carta et al., 2003). In European and Canadian studies have been found that depressed subjects use more health care resources than those affected by chronic somatic disorders or healthy subjects (Dowrick et al., 2000; Stein et al., 2006).

Insufficient treatment of depression is associated with a low detection level (Stein et al., 2006); therefore additional knowledge of the risk factors for depression could be useful. Most European studies of the major depression prevalence (Bijl et al., 1998; Ayuso-Mateos et al., 2001; Bijl and Ravelli, 2000; Herrman et al., 2002; Alonso et al., 2004) generally agree on the risk factors for depression (Fryers et al., 2004), but data from Eastern Europe are still needed (Paykel et al., 2005). Probably European regions do not differ that much with regard to the depression prevalence rates, but they rather differ by factors associated with depression. The degree of inequality between the groups with a higher and lower socioeconomic status is much higher in some European

countries, which is in line with considerable inequality in mortality in the eastern and Baltic regions (Mackenbach et al., 2008). Social inequality and high mortality could also affect associations between depression and the sociodemographic factors, or modify how the social network influences health service utilization (Albert et al., 1998; Kang et al., 2007; Maulik et al., 2011) in the Eastern European regions.

Considering the detrimental effect of depression on health status and the resulting economic losses (Jefferis et al., 2011; Lepine, 2011), there is a need to study the factors associated with depression prevalence and help-seeking. Beside sociodemographic and health status factors there is a need to consider the association between alternative factors and depression. For example, social support factors, which have an important influence on shaping help-seeking behaviour in the case of mental disorders (Angermeyer et al., 2001; Bijl and Ravelli, 2000; Carpentier and White, 2002).

2. REVIEW OF THE LITERATURE

2.1. Symptoms and course of depression

The DSM-IV defines a major depressive episode (MDE) as a period of two weeks or more in which at least five symptoms are expressed most of the day, nearly every day, including either depressed mood or the loss of interest in nearly all activities, weight/appetite disturbance, sleep disturbance, psychomotor agitation/retardation, fatigue, feelings of worthlessness/guilt, decreased concentration/decision-making, and suicidal ideation. Major depressive disorder (MDD) can consist of one or more major depressive episodes. Major depression (MD) is used as a synonym for MDD (Kaplan and Sadock, 1997).

Usually the major depressive disorder (MDD) has a chronic-intermittent course with several recurrent episodes (Angst, 1997; Andrade et al., 2003; Kennedy et al., 2003; Paykel et al., 2005; Burcusa and Iacono, 2007). The tendency for recurrence has been found to be approximately 30 to 50 per cent in the first two years (Melartin et al., 2004; Kronmüller et al., 2007; Eaton et al., 2008; Luijendik et al., 2008; Suija, et al., 2009; Vuorilehto et al., 2009). In the long term around 75% of depressed persons have at least one further episode (Paykel et al., 2005). The risk of recurrence could be overemphasized when using data from clinical samples with most severe psychopathology (Holma et al., 2008). Recurrence is lower in the general population (35% after 15 years) (Hardeveld et al., 2010). About half of those with a first-onset episode recover and have no further episodes (Holma et al., 2008; Eaton et al., 2008). The probability of recovery declines over time and up to 25% of patients develop chronic depression (Angst, 1997; Satyanarayana et al., 2009). Chronic major depressive disorder (CMDD) is defined as meeting criteria for major depressive episode continually for at least 2 years (Kaplan and Sadock, 1997). The 12-month prevalence of CMDD among depressed population has been found to be 26.5% (Rubio et al., 2011). Recurrent patients have greater rates and severity of depressive and somatic symptoms; the severity of symptoms increases with the number of episodes (Roca et al., 2011). The chronic course of MDD has been found to be related to worse socioeconomic conditions (Rubio et al., 2011).

The risk factors for recurrence in adults include age at the onset, number of episodes, severity, comorbidity, family history, cognition, personality (neuroticism), poor social support, and stressful life events (Burcusa and Iacono, 2007). Past depressive episodes significantly increase the risk of a new episode (Kivelä and Pakkala, 2001; Cole and Dendukuri, 2003). Clinical factors like severity of depression (Spijker et al., 2002; Melartin et al., 2004; Spijker et al., 2004) and comorbidity (Melartin et al., 2004; Satyanarayana et al., 2009; Vuorilehto et al., 2009; Rubio et al., 2011) seem to be the most important predictors of recurrence (Hardeveld et al., 2010).

Severe symptoms and the chronic course could have serious consequences. Depression is one of the most disabling disorders (Kivelä and Pakkala, 2001; Mathers et al., 2003; Paykel, et al., 2005; Katon, 2003; Katon, 2011) causing

significant impairment of social (Kessler et al., 2003; Adams et al., 2011) and physical functioning (Rhebergen et al., 2010). While causing work-role disability and a decreasing quality of life, major depression can have even a stronger impact than common chronic physical disorders (Alonso et al., 2004). General recovery from MDE usually leads also to recovery from functional impairments (Buist-Bouwman et al., 2004), but the disabling effect of psychopathology could last longer than recovery from a mental disorder (Bijl and Ravelli, 2000). During MDE, disability tends to increase in first- and recurrent-MDE subjects. The disabling effect of depression is smaller when the premorbid period is shorter than the postmorbid period (Ormel et al., 2004). This makes timely diagnostic and effective treatment of depression especially valuable.

2.2. Prevalence of depression and associated sociodemographic factors

Prevalence of depression has been studied thoroughly, but it is still an important issue as the obtained rates vary between the studies. Prevalence variability seems to depend mostly on sociodemographic and health factors or the methodology used.

Lifetime prevalence of major depression has been estimated to vary around 15% (Andrade et al., 2003; Kessler et al., 2003; Hasin et al., 2005). The ratio of 12-month to lifetime prevalence has been found to be approximately 40%, the 12-month prevalence being around 6.0 % (Andrade et al., 2003; Kessler et al., 2003; Hasin et al., 2005).

The point prevalence of depression in adults could be between 3.3 and 4.9% (Blazer et al., 1994; Olsen et al., 2004; Esposito et al., 2007) although there are results of point prevalence of major depression as high as 11.0% in general practitioner's population (Anseau et al., 2008), which is not directly comparable with data from the general population. In Eastern European urban populations the prevalence of depressive symptoms has been found to be 19% to 23% in men and 34% to 44% in women (Bobak et al., 2006).

Depression prevalence is usually higher among women (Lindeman et al., 2000; Fryers et al., 2004; Lehtinen et al., 2005; Paykel et al., 2005; Anseau et al., 2008; Bromet et al., 2011). In the ODIN study, the point prevalence of depressive disorders in Europe was 10.0% for women and 6.6% for men (Ayuso-Mateos et al., 2001). The difference between the genders decreases with advancing age (Patten et al., 2006).

Research has shown that single status, either living alone (Anseau et al., 2008; Smits et al., 2008), being never or no longer married (Blay et al., 2007), widowed, separated, or divorced (Akhtar-Danesh and Landeen, 2007; Hasin et al., 2005) are all associated with depression. Married people have the lowest prevalence (Aluoja et al., 2004), but the effect of marital status can change with age (Patten et al., 2006).

Many studies have shown that younger age groups (Blay et al., 2007) or middle-aged people (Hasin, et al., 2005; Paykel et al., 2005) have higher depression prevalence. On the other hand, some studies suggest that mental health deteriorates with increasing age (Lehtinen et al., 2005), and the highest depression rate can be observed in the senior age group (Kolchakova and Akabaliev, 2003). The association between age and depression seems to be influenced by additional factors combined with age. In case one takes into consideration decreased income, physical disability, and decreased social support, which accompany increasing age (Blazer et al., 1991; Blay et al., 2007), the effect of more advanced age on depression prevalence decreases. The findings of the World Mental Health Survey Initiative (Bromet et al., 2011) showed the importance of the income level in this context. In high-income countries, younger age was associated with higher 12-month prevalence of depression; in several low-middle income countries, by comparison, older age was associated with greater likelihood of MD.

A low level of education has been found to be significantly associated with a higher level of depression (Anseau et al., 2008; Smits, 2008); there is strong likelihood that the effect could be mediated by income factors associated with a lower educational level (Ladin, 2008; Chazelle et al., 2011). In fact, there are also opposite results indicating that there is no link between major depression and the level of education (Patten et al., 2006; Blay et al., 2007).

Some studies have found that urban residency could be a risk factor for depression (Lindeman et al., 2000; Ayuso-Mateos et al., 2001; Wang et al., 2004) while others report no such differences (Aluoja et al., 2004; Kessler et al., 2003), or that rural origin could be a risk factor in the older population (Blay et al., 2007).

Economically less privileged groups (Hasin et al., 2005; Paykel et al., 2005; Fryers et al., 2005; Patten et al., 2006; Blay et al., 2007; Suija et al., 2009) and people experiencing social adversity (Fryers et al., 2004; Paykel et al., 2005; Lehtinen et al., 2005; Blay et al., 2007) have a higher risk of depression. Unemployment as a risk factor for depression has been confirmed by many studies (Hämäläinen et al., 2005; Patten et al., 2006; Anssaeu et al., 2008; Blay et al., 2007; Jefferis et al., 2011). Income has been found to make a difference in the prevalence rates of depression. According to the World Mental Health Survey Initiative, the average lifetime and 12-month prevalence estimates of DSM-IV MDE varied two to three times between the high income and the low-middle income countries (Bromet et al., 2011).

In conclusion, one could claim that different studies show varying associations of depression with the sociodemographic factors, which seem to be most of all associated with different socioeconomic levels of countries (Mackenbach et al., 2008) or different age groups.

2.3. Health status and depression

2.3.1. Depression, chronic somatic disorders, and self-rated health

Health problems, especially long-term and chronic conditions, are strongly associated with depression (Patten, 2001; Paykel et al., 2005; Egede, 2005; Vuorilehto et al., 2005; Patten et al., 2006; Smits et al., 2008). About half of depressed persons have significant medical comorbidity (Yates et al., 2004). A total of 88.6% of recurrent patients and 71.1% of first-episode depressive patients have been found to have a medical condition (Gili et al., 2011). A set of conditions characterized particularly by pain, inflammation and/or autonomic reactivity reveals a higher incidence in people with MD (Patten et al., 2008). Significant somatic co-morbidity of depression is associated with older age, lower income, unemployment, limited education, and longer duration of depressive episodes (Yates et al., 2004).

Influences between depression and chronic medical disorder are reciprocal (Benton et al., 2007; Katon, 2003). The non-healthy risk behaviours and psychobiological changes associated with depression increase the risk of chronic medical disorders while biological changes and complications associated with chronic medical disorders may increase the risk of depression (Katon, 2011). Prevalence of co-morbid depression among patients with chronic illnesses can be doubled (Patten, 2001; Rifel et al., 2010). The 12-month prevalence of depression by any chronic condition has been found to be 8.8% (Egede, 2005). The risk of depression increases in older age in the case of two or more chronic illnesses (Smits et al., 2008).

Presence of somatic illness has been found to be among the factors which predict worse functioning after recovery from depression (Buist-Bouwman et al., 2004). People who already have functional impairment due to somatic disease have shown a high risk of depression (Cole and Dendukuri, 2003; Smits et al., 2008; Suija et al., 2009), especially in the case of pain or heart disease (Stegmann et al., 2010). Depression increases functional impairment of chronic medical illnesses, and disability caused by somatic disease increases the risk of depression (Katon, 2003; Katon, 2011). Prevalence of functional disability has been found to be higher in subjects with chronic conditions and co-morbid major depression (46.3%) than in individuals with either chronic conditions (20.9%) or major depression (27.8%) alone (Schmitz et al., 2007).

An important characteristic of impairment is self-perceived poor health, which has been found to be associated with MD (Wittchen et al., 2000; Kivelä and Pakkala, 2001; Cole and Dendukuri, 2003; Lehtinen et al., 2005; Haarasilta et al., 2003). The self-rated health is an indicator that measures an individual's perception of his or her overall health. A predictor of one's real health status, it complements other health status indicators by taking into account such factors as the existence of disease and its severity. Poor self-rated health is generally considered to be a strong predictor of depression (Haarasilta et al., 2003; Wang et al., 2009) while depression is one of the strongest determinants of self-rated poor health (Kivinen et al., 1998). A clear dose-response relationship has been

found between the number of chronic physical problems and depressive symptoms. The relationship between multimorbidity and depression can be mediated via self-perceived health, which is related to one's quality of life (Gunn et al., 2012). Accordingly, self-rated poor health could be a factor that predicts an earlier drop-out from depression treatment and lower response to adequate treatment (Lenze et al., 2001).

Depression and somatic health problems are closely related, with reciprocal influences on the course of each other, resulting in an increased disability rate and self-rated poor health. Therefore, one can hypothesize that the association between health status and depression could be more significant compared to sociodemographic factors.

2.3.2. Alcohol consumption and depression

Close associations have been found between alcohol consumption and depressive symptoms (Dixit and Crum, 2000; Lindeman et al., 2000; Crum et al., 2001; Hämäläinen et al., 2005; Maaros et al., 2010). Association between depression and alcohol consumption is not simply linear. A U-shaped association between alcohol consumption and the risk of depression has been found among low-level alcohol consumers; abstention is related to an increased risk of depression (Skogen et al., 2009). A similar association has been found also in studies considering different variables of alcohol consumption (Rodgers et al., 2000; O'Donnell et al., 2006) with the exception of older age groups (Rodgers et al., 2000).

How drinking patterns are measured has been the key issue in interpreting findings on the relationship between alcohol and depression. Depression is primarily related to drinking larger quantities per occasion, less related to the volume, and unrelated to drinking frequency (Patten and Charney, 1998; Graham et al., 2007). This effect is stronger for women than for men (Graham et al., 2007). The results support the hypothesis that heavy drinking (Levola et al., 2011), and especially the binge pattern involving intoxications (Hämäläinen et al., 2005; Paljärvi et al., 2009), hangovers, or pass-outs, is associated with increased depressive symptoms (Paljärvi et al., 2009). Depression increases the risk of drinking. Consumption of alcohol increases among already depressed alcohol users compared to non-depressed alcohol users (Crum et al., 2001).

The use of alcohol and drugs to relieve affective symptoms is common among depressed persons (Bolton et al., 2009). Alcohol use of depressed persons has a negative impact on the prognosis (Buist-Bouwman et al., 2004) and affects the treatment of depression (Ramsey et al., 2005; Choi and Dinitto, 2011; Satre et al., 2011). Depressed persons seeking treatment often have a history of recent alcohol and drug use or heavy episodic drinking. Alcohol use during the previous 30 days has been reported by half of treatment seekers (Satre et al., 2011).

It could be generalized that alcohol and depression have reciprocal associations, alcohol possibly being one factor which is associated with help-seeking of depressed persons.

2.4. Help-seeking for emotional problems and depression

2.4.1. Help-seeking for emotional problems and associated factors

There is no universal definition of help-seeking for mental health problems. Most often this means seeking help from health service and other professionals but can also include seeking help from relatives etc. In this study help-seeking means turning to different professionals for help. Low level of help-seeking for mental health problems is a rather common phenomenon. The number of persons who seek help for emotional problems is small (Biddle et al., 2004; Sareen et al., 2005; Mauerhofer et al., 2009); they receive treatment with delays (WHO, 2000; Bruffaerts et al., 2007), and the number of persons with different mental disorders who do not undergo treatment is universally large (Alonso et al., 2004; Kohn et al., 2004; Wang et al., 2005).

There can be various reasons why people with possible mental health disorder do not seek help. Both social and individual stigmatizing attitudes could be associated with help-seeking (Mojtabai, 2010). Public attitudes have become more positive over the past decade (Schomerus et al., 2009), and the perceived public stigma is not necessarily the reason to avoid help-seeking (Sareen et al., 2007; Golberstein et al., 2009). The willingness to seek psychiatric help is more connected to self-stigmatization (Schomerus et al., 2009) or self-reported embarrassment (Tedstone Doherty and Kartalova-O'Doherty, 2010) meaning that personal attitudes rather than society influence help-seeking.

Help-seeking is connected to personal beliefs about normal behaviour (Schomerus et al., 2009). Information about professional help can be less important (Angermeyer et al., 2001) than personal basic beliefs and expectations about help (Riedel-Heller et al., 2005). Personal beliefs include also thoughts that professional help can make little or no difference with regard to mental health (Jorm et al., 1997; Kessler et al., 2001; ten Have et al., 2010). One of the most commonly reported reasons for failing to seek treatment has been found to be the wish to solve the problem independently (Kessler et al., 2001). Distressed persons, especially in the older age groups, may have difficulty in believing that their mental health problems could be a legitimate reason for seeking help (Bristow et al., 2011; Chew-Graham et al., 2012), and therefore they fail to perceive the need for help (Mackenzie et al., 2010). Older people have been found to underestimate the need for help, but they have a more positive attitude towards help-seeking than younger persons (Mackenzie et al., 2006). Younger people have been found to have a more negative attitude

towards the mental health service (Oliver et al., 2005), and they seek less help (Kessler et al., 2001; Biddle et al., 2004; Mauerhofer et al., 2009). Females (Biddle et al., 2004; Mackenzie et al., 2006; ten Have et al., 2010; Mills et al., 2011), divorced persons, and people living in non-rural areas seek help more often (Mills et al., 2011).

People tend to believe and act upon their own experience. Self-perceived need for help (Sareen et al., 2005; Eisenberg et al., 2007), previous use of service (Burns et al., 2003; Biddle et al., 2004; Hatchett 2006; ten Have et al., 2010), and symptom severity (Bebbington et al., 2000; Biddle et al., 2004) together with impairment in role functioning (Mojtabai, 2002) are the most important predictors of seeking help for mental health problems.

Access to help (Hämäläinen et al., 2004) and presence of insurance coverage are factors that influence help-seeking for mental health problems (Wang et al., 2000). Access to free medical care has been found to be a strong predictor of seeking help especially for males (Tedstone Doherty and Kartalova-O'Doherty, 2010). There are also studies which argue that even in the case of universal access to help most persons in need for help do not receive any treatment (Eisenberg et al., 2007), and lack of health insurance is not the reason for the unmet need for mental health treatment (Kessler et al., 2001; Young et al., 2001).

In summary, there are many people who just do not recognize their mental health problem (Jorm et al., 1997; Kessler et al., 2001) or do not feel that they need help (Kessler et al., 2001). If people seek help, they do it mostly because of more serious symptoms. Rather, the low level of help-seeking is associated with the person's attitude (e. g. thoughts that the problem could be solved on its own) (Sareen, et al., 2007) than financial (Kessler et al., 2001) or structural barriers (inability to make an appointment) to service utilization (Sareen, et al., 2007).

2.4.2. Help-seeking and treatment of depression

Help-seeking of depressed persons follows the same pattern as in the case of mental health problems generally— about one-fourth (Burns et al., 2000; Lepine et al., 1997) to one-third (Wang et al., 2005) of depressive subjects receive no help whatsoever.

First of all the low level of received help is connected with the low level of help-seeking – approximately one-third of persons with affective disorders seek help (Bebbington et al., 2000; Burns et al., 2003; Roness et al., 2005; Wallerblad et al., 2012). 12-month help-seeking for major depression has been found to be between 40% (Spijker et al., 2001; Aromaa et al., 2011) and 60% (Wang et al., 2005).

Another reason why depressed persons do not receive enough help is the inability to recognize depressive symptoms either by doctors (Mitchell et al., 2009) or by the depressed persons themselves. While being depressed it can be difficult to admit the severity of depression (Hickie et al., 2007; Klineberg et al., 2011), or one may not be able to seek help because of core symptoms of

depression. Low-self esteem because of depression can lead to avoidance of discussion of the existing problems or not demanding sufficient treatment from doctors (Gask et al., 2003).

Several studies have concluded that there is no association between socio-demographic factors and help-seeking for depression (Hämäläinen et al., 2004; Roness et al., 2005; Roy-Byrne et al., 2009). Other studies have shown the importance of some socio-demographic factors. Living alone (Hämäläinen et al., 2008), higher education, single parenthood, and unemployment have been found to increase the use of mental health care (Bijl and Ravelli 2000). Significance of low income as a financial barrier can vary in different countries with different health care systems (Sareen et al., 2007). Lack of medical insurance has been shown to affect the frequency of help-seeking of depressed persons (Young et al., 2001; Mojtabai, 2009) but not the quality of received care (Young et al., 2001). Results indicate that if health care is easily accessible, treatment depends on clinical factors of depression rather than on one's socio-demographic background (Spijker et al., 2001).

The likelihood of depression treatment seems to depend mostly on severity (Bebbington et al., 2000; Herrman et al., 2002; Burns et al., 2003; Hämäläinen et al., 2004; Hämäläinen et al., 2008), functional limitations (Spijker et al., 2001; Hämäläinen et al., 2004; Hämäläinen et al., 2008) and co-morbidity of depression (Haarasilta et al., 2003; Aragonés et al., 2007; Cole et al., 2008; Hämäläinen et al., 2008). More severely depressed persons use more professional help and tend to contact multiple professionals (Sareen et al., 2005; Uebelacker et al., 2006), but severity does not influence the sector where treatment is received (Kessler et al., 2007).

Depressed persons seek help from different professionals. Most depressed persons receive care from the general practitioner (GP) or from similar system to that (Burns et al., 2000; Young et al., 2001; Aromaa et al., 2011), and only one-fifth access a mental health specialist (Burns et al., 2000; Lepine et al., 1997). Help-seeking patterns can be associated more with different depression correlates than access to the health service. More severe cases tend to be treated in psychiatric care (Gaebel et al., 2012). Patients with higher somatic co-morbidity receive treatment more often from their GP (Uebelacker et al., 2006). Gender, age, marital status, residence, education, and income have been found to affect the selection of the healthcare provider (Gudmundsdottir and Vilhjalmsson 2010). If a person has already contacted the general medical service, then perceived poor health, core depressive symptoms, a history of depression, and co-morbid mental conditions increase the odds of receiving special mental health care (Burns et al., 2000). A special question in this context is how much co-morbidity of depression and somatic disorder influence the diagnosis, treatment, and prognosis of the somatic disorder (Filipčić et al., 2007) and vice versa. The management of depressed patients with and without co-morbidity in primary care has been found to be generally similar (Aragonés et al., 2007), but there is also evidence that the co-morbid somatic disorder can

lead to underdiagnosis and a low-level treatment of depression (Nuyen et al., 2008).

Treatment of depression is not always conducted according to the guidelines and can be inefficient (Wang et al., 2000). Among depressed persons who receive treatment only more severe cases receive antidepressant treatment (Spijker et al., 2001). Only one-third of the subjects with MD use antidepressants, and less than one-fifth receive psychological treatment (Hämäläinen et al., 2009).

While depressed persons do not get sufficient help for depression, they use more health care resources than those affected by chronic somatic disorders or healthy subjects (Dowrick et al., 2000; Stein et al., 2006). Depression increases the number of visits to one's GP almost three times compared with non-sufferers (Lepine et al., 1997). Some results showed that depressive persons did not visit their family doctor more often than non-depressed persons (Suija et al., 2009).

In conclusion, there is a need to investigate what leads depressed persons to seek help, from whom and why, because the cost of inexpedient use of economic resources could be considerable.

2.5. Depression and social support

2.5.1. Definition of social support

Social support has been defined as “information leading the subject to believe that he or she is loved, esteemed, and belongs to a network of mutual obligations” (Cobb, 1976, p.300). However, the term may have different meanings depending on the particular study or the way of measuring it.

There are two groups of processes through which social relationships can influence health. One type of process involves the provision or exchange of emotional, informational, or instrumental resources in response to the perception that others are in need of such aid. Here, the term social support is used to refer to the social resources that persons perceive to be available or that are actually provided to them by non-professionals through formal support groups and informal helping relationships (Cohen et al., 2000). It can be understood as the functional aspect of the social network, which emphasizes the qualitative nature or type of relationship and perceptions of supportiveness (Kang et al., 2007; Maulik et al., 2009).

The other type of process focuses on the health benefits that accrue from participation in one or more distinct social groups. The basic idea here is that other people can influence our thinking, feelings, behaviour, and health in manners beneficial to health and well-being through interactions that are not directly intended to exchange help or support, for example, through increased self-worth and personal control (Cohen et al., 2000). Closely connected to this approach is the concept of social integration. Social integration has been defined as a diverse range of relationships or involvement in a range of social activities

or as a number of network members. Relationships assessed in a typical social integration measure include one's spouse, close family member, friend, neighbour, and members of social and religious groups (Cohen et al., 2000). In a more narrow sense this can be understood as the social network or the structural aspect of social support. Structural indicators of the social network can be the number of social ties, frequency of contacts with others, participation in social activities and organizations, as well as one's living arrangements and cohabitation status (Olstad et al., 2001; Kang et al., 2007; Mechakra-Tahiri et al., 2010).

2.5.2. Associations between depression and social support

There are two models that identify the conditions under which different kinds of social support influence health. The stress-buffering model proposes that support is related to well-being only for persons under stress. According to the main (or direct) effect model, social resources have a beneficial effect irrespective of whether persons are under stress or not. The data suggest that whether one actually receives some support or not is less important for health and adjustment than one's beliefs about its availability (Cohen et al., 2000).

Several studies have confirmed the association between low social support and depression (Wade and Kendler 2000; Sinokki et al., 2009; Patten et al., 2010; Moak and Agrawal 2010). Many studies describe this association in specific groups, such as elderly persons (Prince et al., 1997; Heikkinen and Kauppinen 2004; Golden et al., 2009) or elderly women (Glaesmer et al., 2011). It has been found that functional characteristics of social support account for more variance in depressive symptomatology than structural measures of social support (Antonucci et al., 1997; Albert et al. 1998). The effect of marital status on depressive symptoms is mediated by family support and moderated by friend support (Zhang and Li, 2011), which also stresses the importance of the functional quality of social support rather than the existence of social ties per se.

Persons who feel socially isolated have a higher risk of depression (Hawthorne, 2008; Chou et al., 2011). In a broader sense, the alternative of functional measures of social support is in the concept of loneliness, which has been found to be associated with impaired health and health-related behaviour (Hawkley and Cacioppo, 2010). Loneliness "concerns the subjective evaluation of the situation individuals are involved in, characterized either by a number of relationships with friends and colleagues which is smaller than is considered desirable (social loneliness), as well as situations where the intimacy in confidant relationships one wishes for has not been realized (emotional loneliness)" (De Jong Gierveld and Van Tilburg, 2010, p.121). A reciprocal influence has been found between loneliness and depressive symptomatology (Cacioppo et al., 2006), loneliness being a strong longitudinal predictor of changes in depressive symptomatology independent of demographic factors, objective social isolation, exposure to life stressors, perceived stress, negative affectivity, or social support (Cacioppo et al., 2010). The persistence of MDD

has been found to weaken both the objective and subjective ratings of social support (Leskelä et al., 2008).

It is not fully clear whether functional and structural factors of social support have equal importance or not and whether social and emotional loneliness have similar associations with depression.

2.5.3. Associations between help-seeking and social support

Help-seeking is a complex process, which is influenced not only by practical matters, such as health insurance, but depends also on the person's past and present life experience and their specific interactions with relevant others, such as one's family and friends (Bristow et al., 2011). The importance of one's social support system in help-seeking has been found to be significant (Carpentier and White, 2002). The use of medical services increases in the case of increased contact with the social network and higher levels of social support (Albert et al., 1998; Carpentier and White, 2002; Maulik et al., 2009). More cohesive social networks have been found to succeed in referring the family member to services and in maintaining a clinical follow-up (Carpentier and White, 2002).

The meta-analysis by Albert et al. (1998) reveals controversial data about the association between social support and help-seeking. Some studies have reported a positive relationship between social networks and use of mental health services, whereas others have reported that the social network does not support service utilization. Later studies have also claimed that help-seeking is not at all predicted by social support (Ng et al., 2008), or that the social network is associated with mental health utilization in various ways (Kang et al., 2007). Other studies have shown that more social support increases the use of general medical services and decreases the use of services within the specialty psychiatric sector (Kovess-Masféty et al., 2007; Maulik et al., 2009).

Whether social support increases help-seeking can depend on the type of mental disorder and knowledge of the close network about the disorder and help-seeking. People, especially the younger age group (Hickie et al., 2007), seek help first of all from one's family and friends (Griffiths et al., 2011). In the case of 'other-defined' disorders, such as psychosis, close network members often initiate help-seeking (Morgan et al., 2005). In the case of affective symptoms, the findings suggest that until there is no understanding how seriously depression can decrease the quality of life, social support is strongly protective against needing help (Burns et al., 2003). Most depressive patients receive support from family members, friends, and co-workers (Cooper-Patrick et al., 1997), but there are also some disadvantages (Griffiths et al., 2011). Concern of relatives, peers, and other important persons over the depressed person's health leads to help-seeking (Fröjd et al., 2007), but it can be delayed because of the lack of understanding regarding depression on the part of the close network (Cooper-Patrick et al., 1997).

Generally the data about the link between help-seeking and social support, especially in the case of depression, are still conflicting. Previous studies were conducted on selected populations, the results have been controversial, and there is a need to replicate the findings in other studies (McCracken et al., 2006).

2.5.4. Depression, perceived control, and help-seeking

The social learning theory of depression integrates the concepts of control, coping, and social support suggesting that lack of positive reinforcement from others may lead to negative self-evaluation and a poor outlook for the future.

A sense of control is “a set of beliefs held by individuals regarding the amount of control they have over what happens in their lives” (Skaff, 2007). The sense of control can be described by such concepts as locus of control, mastery, and helplessness – concepts that have relatively many similarities or considerable overlapping. The most commonly used constructs in relation to health have been self-efficacy and locus of control (Skaff, 2007). Psychological distress has been found to be predicted by a low level of general self-efficacy as well as a high level of external health locus of control (Wu et al., 2004).

Control can be perceived or real. Perceived control has been found to be of significance for patients with psychiatric disorders and may be regarded as an aspect of empowerment. Self-mastery and locus of control have been found to be mediators of perceived health (Eklund and Bäckström, 2006).

Locus of control (LOC), originating from Rotter's social learning theory, refers to the extent to which an individual perceives events in his or her life as resulting from his or her actions and, thus, under his or her perceived control. It can be assessed in terms of whether one believes that events in people's lives result from their own efforts, skills, and internal dispositions (internal control) or stem from external forces such as luck, chance, fate, or powerful others (external control) (Rotter, 1966).

Locus of control has been found to have some effect on the receipt and impact of social support. Persons with more external locus of control have been found to receive more social support while social support has been shown to decrease the influence of stress of persons with internal locus of control (Sandler and Lakey, 1982).

Persons with higher external locus of control are more vulnerable to life event stress than persons with internal locus of control (Hutner and Locke, 1984). Also, external locus of control has been found to be associated with depression (Daniels and Guppy, 1997; Harrow et al., 2009; Paukert et al., 2009). People with stronger perceptions of control (Keeton et al., 2008; Gallagher and McKinley, 2009) and better coping skills (Heath et al., 2008) are less prone to depression in the case of a stressful situation. Active coping and higher social integration has been found to be associated with less depression for people with higher internal locus of control (Park et al., 2012).

A common reason for the avoidance of treatment-seeking for depressed persons is the preference to cope by themselves (Kessler et al., 2001; van

Beljouw et al., 2010). Seeking for treatment has been found to be associated with the perceived failure of coping strategies (Rogers et al., 2001; Cornford et al., 2007; Khan et al., 2007). On the other hand, good coping can also mean conscious control over one's mental health problems and help-seeking. It has been found that people with a higher education and higher income, who more often have acquaintances working in mental health and have lower dependence on the GP for the treatment of common disorders, are more prone to seek help for emotional problems. It is possible that they may not regard chance as the locus of control of health (Tijhuis et al., 1990). Also, socioeconomically wealthy persons might seek professional help in order to take conscious control over their situation. In this case internal locus of control could enhance help-seeking, especially in the case of better social support.

There are no clear data about how social support and LOC are associated with help-seeking by a depressed person. There remains the question whether depressed persons with more external locus of control seek more professional help as they feel helpless when coping with their problems on their own. Or they could seek less help because they received more social support, as mentioned previously (Sandler and Lakey, 1982)? Previous studies (Albert et al. 1998; Carpentier and White, 2002) suggest that there is still a need to study how different factors of social support interact with each other and whether there are any important additional factors in this context.

Knowledge of prevalence of depression, help-seeking, and associated factors need additional data from countries with different socioeconomic and health situations. Therefore, this study aims to find out about depression prevalence, help-seeking for emotional problems, and associated factors in Estonia.

The main hypotheses state that the socioeconomic situation and the health status reveal strong associations with depression; structural and functional factors of social support are associated with depression; emotionally lonely and people with external locus of control have more depression; the level of help-seeking for emotional problems is low both among the general population and depressed persons; sociodemographic factors have no significance in help-seeking; depression severity, social support, and external locus of control increase help-seeking in the case of depression.

3. AIMS OF THE STUDY

The aims of this study were as follows:

1. to estimate the prevalence of major depression in Estonia;
2. to establish the associations of sociodemographic factors, health status indicators, and social support with depression;
3. to study 12-month help-seeking for emotional problems and associated sociodemographic and health status factors in the general population;
4. to study 12-month help-seeking and associated sociodemographic factors, health status indicators, and social support and depression treatment among depressed persons.

4. SUBJECTS AND METHODS

4.1. Setting and study design

The study was part of the 2006 Estonian Health Interview Survey (EHIS), the second large-scale national survey to measure health, health-related behaviour, and health determinants. EHIS 2006 was a cross-sectional retrospective study where the event history approach was used. It was a part of the European Health Survey System, and the methodology of the survey is described in more detail elsewhere (Oja et al., 2008).

4.2. Sampling and subjects

The target population of EHIS 2006 consisted of all permanent residents of Estonia aged 15–84 on January 1, 2006 (Figure 1). The Population Registry served as the population frame. The stratified systematic sampling method was used to select the sample. The initial sample size was 15,000 persons. Before the fieldwork began, 11,023 persons were selected from the initial sample by simple random sampling. The reduction of the sample size was made due to insufficient interviewer resources but in accordance with representativity calculations. The corrected response rate was 60.2%. The response rate was lower in the younger age group, among men, and in regions with major cities. The final dataset included 6,434 persons. The present study included only adults aged 18–84 years, and therefore the final sample size was 6,105 persons (2,928 men and 3,177 women).

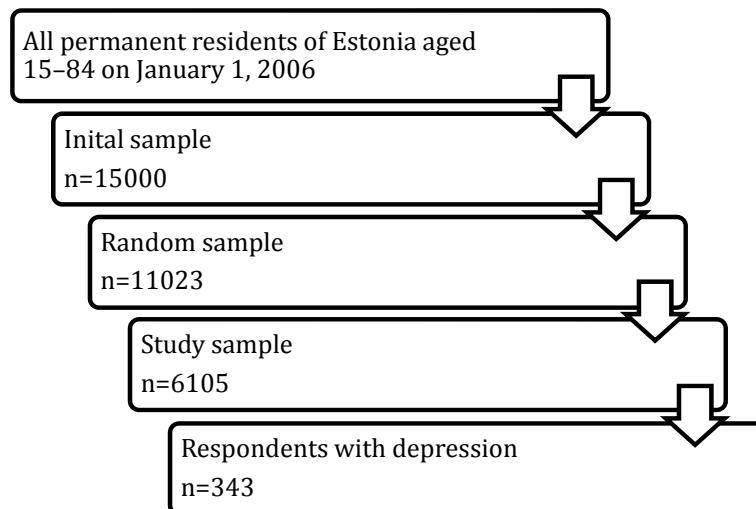


Figure 1. Sample formation

4.3. Measures

The data about sociodemographic, health status, alcohol use, help-seeking, depression treatment and social support factors, as well as depression characteristics were derived from the structured interviews of EHIS 2006 (EHIS, 2006). The survey instrument was both in Estonian and in Russian and consisted of 22 different units. To ensure international comparability of the data, the methodological aspects of translating the questionnaire were determined by the Statistical Office of the European Communities.

4.3.1. The Mini-International Neuropsychiatric Interview (M.I.N.I.)

To measure depression and previous depressive episodes, the participants were interviewed using the depressive episode module of the Mini-International Neuropsychiatric Interview (M.I.N.I.). M.I.N.I. is a short structured diagnostic interview, developed for DSM-IV and ICD-10 psychiatric disorders (Lecrubier et al., 1997). In 1999 M.I.N.I. 5.0.0 was adapted to Estonian at the Department of Psychiatry, University of Tartu. The number of depressive symptoms indicated the severity of the depressive episode.

To determine past depressive episodes, two questions were used about the main diagnostic criteria of DSM-IV major depression during one's lifetime:

- *During your lifetime, have you ever had a period of two weeks or more when you were consistently depressed or down, most of the day, nearly every day?*
- *During your lifetime, have you ever had a period of two weeks or more when you were less interested in most things or less able to enjoy the things you used to enjoy most of the time?*

4.3.2. Sociodemographic measures

Income denotes the average monthly income in Estonian kroons (EEK) per household member in the previous twelve months. Income quartiles were used to divide respondents into four groups: ≤ 5000 , 5001–8000, 8001–13,000, $\geq 13,001$. Occupational status was determined by the current or previous occupation of the respondents.

4.3.3. Health status and alcohol consumption measures

Self-rated health was measured by the question: *Overall, how do you evaluate your health status?* The answers were scored into three groups. Health status was a complex measure that consisted of questions about health problems during the previous twelve months, need for care, intoxications, injuries, and functional limitations. Health behaviour was a complex measure, which included drug use, eating habits, use of health services, physical activity, smoking, alcohol use, and the body mass index. Questions about health were derived from the European Health Status Module (Oja et al., 2008). To estimate

the presence of chronic somatic disease, the following questions were asked: *Have you ever suffered from any chronic disease or long-term illness? Has this illness/health problem recurred also during the last 12 months?* Participants indicating that a long-term disease had recurred during the previous 12 months except chronic anxiety or depression were classified as having a chronic somatic disease.

An indicator of problematic alcohol consumption was occurrence of binge drinking during the previous 12-month period, which meant drinking the amount of 5 bottles of beer or 5 glasses of wine or 5 glasses of vodka at a time. '12-month binge drinking' was divided into four categories, where 'never' included persons who had never used alcohol or had never had indulged in binge drinking in their lifetime or during the previous 12 months. 'Some times per year', '1–3 times per month', and 'at least once a week' indicated the frequency of bingeing during the previous 12 months. The above-mentioned questions were partly based on the European Health Determinants Module (Oja et al., 2008).

4.3.4. Help-seeking and depression treatment measures

Help-seeking for emotional problems and for other health issues was assessed with the following questions: *Have you ever in your life sought help because of emotional problems (depression, anxiety)? Whom have you turned to for help? Have you sought help due to your emotional problems (depression, anxiety) during the previous 12 months? Whom have you turned to for help because of your emotional problems during the previous 12 months?*

What methods were used for the treatment of your emotional problems during the previous 12 months? Have you seen a family doctor (GP) due to your health problems during the past 4 weeks and during the past 12 months? Have you called for an ambulance due to your health problems during the past 12 months? Have you visited the emergency department (EMD) due to your health problems during the past 12 months? Have you received hospital treatment during the past 12 months? Do you have valid medical insurance?

The treatment gap was expressed as the percentage of individuals who needed care but did not receive any treatment (Kohn et al., 2004). When estimating the treatment gap, the depressive subjects who reported 'no treatment' were combined with those who did not seek help.

4.3.5. Social support measures

Measures of structural factors of social support included household size, cohabitation, frequency of contacts outside the home with parents, children and friends, and membership in organizations. Household size was used as a continuous measure of social network size. Frequency of contacts was assessed with the question: *Please tell us with whom you communicate and/or meet during your free time and how often?* Three main categories were formed from

11 subcategories of different contacts. *Frequency of contacts with parents (parents)* included communication with one's own parents or grandparents, partner's parents or grandparents and sister or brother; the category *frequency of contacts with children (children)* included son or daughter, son- or daughter-in-law (or partner of a grown-up child) and grandchild; the category *frequency of contacts with friends (friends)* pooled other relatives, friends, colleagues or study mates, neighbours, and acquaintances. The answers *do not meet/communicate at all=1, at least once a year but not every month=2, once a month=3, several times a month but not every week=4, every week but not every day=5, every day=6* and *inapplicable* (used when respondent did not have indicated person in his/her life)=1 were summarized into the total score for three main categories. The persons who reported membership of at least one organization from 11 categories of different organizations were categorized as *being member of an organization (organization)*. The variable *cohabitation* was formed on basis of *marital status*, where the categories *never married/lived in unmarried partnership, divorced, separated and widowed* were regarded as *no cohabitation* and the categories *married and unmarried partnership* as *cohabitation*.

To measure emotional and social loneliness, The De Jong Gierveld Short Scales for Emotional and Social Loneliness (De Jong Gierveld and VanTilburg, 2010) were used. The De Jong Gierveld 11-item loneliness scale has two subscales – emotional loneliness (six items) and social (five items) loneliness. Additionally, emotional satisfaction with couple relationship (satisfaction) was used to describe functional quality of a social relationship. The question *How satisfied are you with your emotional relations with your spouse/partner* was asked. The categories *satisfied and rather satisfied* were united into the category *satisfied*, and the categories *rather not satisfied and not satisfied* were regarded as *not satisfied*. Persons who answered *having no partner* were also included in the analysis as a separate category. Emotional and social loneliness, and emotional satisfaction with couple relationship (satisfaction) were used as functional factors of social support.

4.3.6. Locus of control measures

Locus of control was measured using three items from the Rotter Internal-External Locus of Control Scale (I-E Scale). The items have a forced-choice response format where respondents are instructed to select one statement out of each pair. Higher scores indicate a greater degree of externality (Rotter, 1966). The question pairs were:

- I *Everything that happens to me depends on me and I don't have control over what happens in my life.*
- II *I'm almost always sure that I can realize my plans and There is no sense to make plans for a long period because life goes its own way.*
- III *In solving problems I usually take initiative myself and In solving problems I usually let the others take initiative.*

4.4. Data collection and management

Face-to-face structured interviews were carried out by professional interviewers in 16 regions (15 counties and the capital city) in 2006–2008. A questionnaire-based training session was conducted for the coordinators and interviewers.

The data entry software program Blaise 4.7 was used to create the EHIS database. In all, 119 logical controls were used to detect data entry and interviewer errors. The total number of completed questionnaires was 6,512, of which 78 questionnaires were excluded due to gross interviewer errors or missing data. After the data entry process 6,434 cases were recorded in the database (Oja et al., 2008).

4.5. Statistical analysis

Prevalence estimates of the current depressive episode were calculated for the total sample and for gender and age subgroups (Publication I). Proportions of 12-month help-seeking for emotional symptoms were calculated for the whole sample and for the depressed subsample (Publication II).

Logistic regression analyses were performed in the general population sample to assess the associations between the current depressive episode, help-seeking, and the study variables. Model 1 was calculated by taking each correlate at a time, and a multivariate logistic regression model (Model 2) was constructed from the variables found significant in Model 1 (Publications I, II and III).

Logistic regression analysis was performed for the depressed sample, the dependent being help-seeking. Model 1 was calculated by using each correlate at a time, and a multivariate model was adjusted simultaneously for all the sociodemographic and health status factors found significant in Model 1 (Publication II).

Logistic regression analysis was used to assess the association between the used health service type and depression. Chronic somatic diseases were added in the multivariate model (Publication II). All regression analyses were adjusted for age and gender.

Interactions of relationship indicators with other factors were tested using logistic regression analysis. Pairs of emotional loneliness and other social support factors were used as predictors in the first block of binary logistic regression. In the second block, the same pairs and the interaction between these variables were entered. Age was entered as a continuous variable (Publication III).

The results were reported as odds ratios (OR) at 95% confidence intervals (CI). The level of statistical significance was set at $p < 0.05$.

Data analysis was carried out using the SPSS 17.0 for Windows (SPSS Inc., Chicago, IL, USA).

4.6. Ethics

The survey was approved by the Tallinn Medical Research Ethics Committee (approval No. 1089). All the persons gave their informed consent prior to inclusion in the study. There are no known conflicts of interest. All authors certify responsibility for the manuscript.

5. RESULTS

5.1. The prevalence of major depression in Estonia and the associations of sociodemographic factors, health status indicators, and social support with depression (Publications I and III)

The number of persons who had a major depressive episode according to DSM-IV criteria during the survey period was 343. The point prevalence of major depression in Estonian population was 5.6% (S.E.=0.00295; 95% CI 5.04...6.20).

A general description of the sample and association of depression with sociodemographic factors, health status indicators, alcohol use and previous depressive episode with results from logistic regression analyses reported as odds ratios are presented in Table 1. Age, income, ethnicity, health status, self-rated health, and past depressive episode were independent associates of depression. Gender, marital status, education, employment status, urban-rural residence and 12-month binge drinking were significant associates of depression only in univariate model. Association between 12-month binge drinking and depression was U-shaped showing significance of both never drinking and drinking at least once a week in relation with depression.

Present study confirmed that social support was associated with depression and both, structural and functional factors of social support were similarly important (Publication III, Table 1). The odds of having depression were higher among non-cohabitants and those who did not belong to any organization. Depression was found to be significantly less frequent in people living in larger households and those who communicated more with their network members. All the functional measures of social support – social and emotional loneliness, as well as emotional satisfaction with a couple relationship – were significantly associated with depression. People who were not satisfied with their couple relationship had a higher frequency of depression. A more external locus of control was associated with higher odds of depression. In the multivariate model ($\chi^2(13)=599.50$; $P < 0.001$; Nagelkerke $R^2=0.271$) low frequency of contacts with friends and parents, emotional loneliness, external locus of control and emotional dissatisfaction with couple relationships remained significant factors for the prediction of depression.

Table 1. Prevalence of depression and associations with sociodemographic and health factors: results from logistic regression

| Factor | Sample size | % in sample | % with depression | Model 1* | | Model 2** | |
|------------------------------|-------------|-------------|-------------------|--------------------|---|-------------|--------------------|
| | | | | OR (95% CI) | P | OR (95% CI) | P |
| Total | 6105 | | 5.6 | | | | |
| Gender | | | | | | | P=0.973 |
| Male | 2928 | 48.0 | 4.0 | 1.00 | | | 1.00 |
| Female | 3177 | 52.0 | 7.1 | 1.82 (1.44...2.29) | | | 1.01 (0.72...1.40) |
| Age | | | | | | | P=0.006 |
| 18–24 | 630 | 10.3 | 2.4 | 1.00 | | | 0.98 (0.96...0.99) |
| 25–34 | 811 | 13.3 | 3.7 | 1.53 (0.82...2.88) | | | |
| 35–44 | 843 | 13.8 | 3.3 | 1.39 (0.74...2.62) | | | |
| 45–54 | 893 | 14.6 | 4.8 | 1.99 (1.09...3.62) | | | |
| 55–64 | 768 | 12.6 | 6.6 | 2.80 (1.56...5.03) | | | |
| 65–74 | 1211 | 19.8 | 6.9 | 3.01 (1.72...5.27) | | | |
| 75–84 | 949 | 15.5 | 9.7 | 4.36 (2.50...7.61) | | | |
| Ethnicity | | | | | | | P<0.001 |
| Estonian | 3925 | 64.3 | 4.0 | 1.00 | | | 1.00 |
| Russian | 1803 | 29.5 | 8.3 | 2.27 (1.80...2.86) | | | 1.83 (1.33...2.51) |
| Other | 377 | 6.2 | 9.8 | 2.53 (1.73...3.70) | | | 2.18 (1.34...3.55) |
| Urban/rural residence | | | | | | | P=0.074 |
| Rural | 1324 | 21.7 | 3.9 | 1.00 | | | 1.00 |
| Urban | 4781 | 78.3 | 6.1 | 1.58 (1.16...2.13) | | | 1.45 (0.97...2.17) |
| Marital status | | | | | | | P=0.123 |
| Married/cohabiting | 3759 | 61.6 | 4.1 | 1.00 | | | 1.00 |
| Single | 773 | 12.7 | 4.7 | 1.53 (1.04...2.26) | | | 1.34 (0.78...2.32) |
| Divorced/separate | 618 | 10.1 | 7.3 | 1.59 (1.12...2.26) | | | 0.63 (0.39...1.03) |
| Widowed | 955 | 15.6 | 11.2 | 1.75 (1.30...2.37) | | | 0.82 (0.53...1.27) |

| Factor | Sample size | % in sample | % with depression | Model 1* | | Model 2** | |
|--------------------------|-------------|-------------|-------------------|-----------------------|-------------|--------------------|--------------------|
| | | | | OR (95% CI) | OR (95% CI) | | |
| Education | | | | | | | |
| University | 1996 | 32.7 | 3.8 | 1.00 | | P=0.292 | |
| Upper secondary | 2875 | 47.1 | 5.2 | 1.46 (1.10...1.94) | | 1.00 | |
| Lower secondary or less | 1234 | 20.2 | 9.5 | 2.07 (1.52...2.83) | | 1.25 (0.87...1.79) | 1.37 (0.91...2.05) |
| Employment status | | | | | | | |
| Working | 3177 | 52.0 | 2.5 | 1.00 | | P=0.185 | |
| Student | 196 | 3.2 | 2.0 | 0.81 (0.29...2.31) | | 1.00 | |
| At home | 192 | 3.1 | 4.7 | 1.60 (0.78...3.29) | | 2.69 (1.13...6.39) | |
| Retired | 2172 | 35.6 | 8.6 | 3.45 (2.25...5.28) | | 0.53 (0.16...1.71) | |
| Unemployed | 127 | 2.1 | 11.0 | 5.16 (2.83...9.43) | | 1.42 (0.80...2.51) | |
| Disability | 241 | 3.9 | 21.6 | 10.73 (7.16...16.08) | | 1.29 (0.73...2.27) | 1.32 (0.53...3.29) |
| Income in EEK | | | | | | | |
| ≤5000 | 1446 | 23.7 | 10.2 | 4.45 (2.80...7.08) | | P=0.027 | |
| 5001–8000 | 1585 | 26.0 | 6.3 | 2.98 (1.88...4.74) | | 2.05 (1.13...3.71) | |
| 8001–13 000 | 1251 | 20.5 | 3.5 | 1.77 (1.07...2.92) | | 1.95 (1.12...3.37) | |
| ≥13 001 | 1352 | 22.1 | 1.8 | 1.00 | | 1.20 (0.67...2.14) | 1.00 |
| Self-rated health | | | | | | | |
| Very good or good | 2384 | 39.0 | 1.1 | 1.00 | | P<0.001 | |
| Average | 2661 | 43.6 | 4.2 | 4.90 (3.14...7.64) | | 1.00 | |
| Very low or low | 1060 | 17.4 | 19.2 | 30.68 (19.16...49.11) | | 1.91 (1.12...3.27) | 5.16 (2.84...9.37) |
| Health status | | | | | | | |
| Healthy | 1624 | 26.6 | 1.3 | 1.00 | | P<0.001 | |
| Health disorders | 1940 | 31.8 | 1.7 | 1.58 (0.90...2.77) | | 1.00 | |
| Serious health disorders | 1117 | 18.3 | 5.8 | 6.27 (3.69...10.65) | | 1.07 (0.55...2.06) | 2.20 (1.13...4.30) |
| Disability | 1424 | 23.3 | 15.7 | 20.88 (12.49...34.94) | | 4.35 (2.22...8.54) | |

| Factor | Sample size | % in sample | % with depression | Model 1* | | Model 2** | |
|------------------------------------|-------------|-------------|-------------------|-----------------------|-------------|-------------|-----------------------|
| | | | | OR (95% CI) | OR (95% CI) | OR (95% CI) | OR (95% CI) |
| Health behaviour | | | | | | | |
| Protective | 918 | 15.0 | 4.7 | 1.00 | | | |
| Neutral | 4570 | 74.9 | 5.8 | 1.23 (0.90...1.69) | | | |
| Hazardous behaviour | 617 | 10.1 | 5.4 | 1.07 (0.66...1.72) | | | |
| Previous depression episode | | | | | | | |
| No | 4297 | 70.4 | 0.5 | 1.00 | | | P<0.001 |
| Yes | 1799 | 29.5 | 15.9 | 48.66 (30.08...78.73) | | | 39.96 (26.55...60.16) |
| 12 month binge drinking | | | | | | | |
| Never | 4264 | 69.8 | 6.5 | 1.54 (1.00...2.39) | | | P=0.344 |
| Some times per year | 833 | 13.6 | 2.9 | 1.00 | | | 1.06 (0.61...1.86) |
| 1-3 times per month | 729 | 11.9 | 3.0 | 1.24 (0.69...2.24) | | | 1.48 (0.72...3.03) |
| At least once a week | 279 | 4.6 | 7.5 | 3.47 (1.88...6.40) | | | 1.85 (0.79...4.31) |

* – adjusted for age and sex; ** – adjusted simultaneously for all factors

5.2. 12-month help-seeking for emotional problems and associated sociodemographic and health status factors in the general population (Publication II)

The prevalence of 12-month help-seeking was 4.8% (S.E.=0.003; OR95% CI4.25...5.32). Logistic regression analyses' results of associations between 12-month help-seeking for emotional problems and associated sociodemographic and health status factors in the general population reported as odds ratios are presented in Table 2. More women than men reported having sought help. Compared with the youngest age group, which had the lowest prevalence, the highest prevalence was found in the 25–34-year and 55–64-year age groups. The odds for help-seeking were also higher in non-Estonian ethnic groups, in lower income and less educated groups, in widows, and in separated persons.

Associations of help-seeking with current and previous depressive episodes, serious health disorder, and disability stayed significant in multivariate model while sociodemographic factors lost their significance.

Table 2. Associations between help-seeking for emotional problems during the previous 12 months and socio-demographic and health factors in the general population: results from logistic regression

| Factor | Model 1* | Model 2** |
|-----------------------------|--------------------|--------------------|
| | OR (95% CI) | OR (95% CI) |
| Gender | P<0.001 | NS |
| Male | 1.00 | |
| Female | 1.94 (1.51...2.49) | |
| Age | P=0.06 | P=0.001 |
| 18–24 | 1.00 | 1.00 |
| 25–34 | 1.86 (1.09...3.17) | 0.98 (0.96...0.99) |
| 35–44 | 1.10 (0.62...1.96) | |
| 45–54 | 1.72 (1.01...2.93) | |
| 55–64 | 1.85 (1.08...3.17) | |
| 65–74 | 1.56 (0.93...2.61) | |
| 75–84 | 1.25 (0.72...2.17) | |
| Ethnicity | P=0.03 | NS |
| Estonian | 1.00 | |
| Other | 1.31 (1.03...1.66) | |
| Urban/rural resident | NS | NS |
| Marital status | P=0.01 | NS |
| Married/cohabiting | 1.00 | |
| Single | 1.37 (0.94...1.99) | |
| Divorced/separate | 1.57 (1.09...2.26) | |
| Widowed | 1.56 (1.10...2.22) | |

| Factor | Model 1* | Model 2** |
|------------------------------------|-----------------------|----------------------|
| | OR (95% CI) | OR (95% CI) |
| Education | NS | |
| Employment status | P<0.001 | NS |
| Working | 1.00 | |
| Non-working | 1.09 (0.69...1.74) | |
| Retired | 1.53 (1.00...2.35) | |
| Disability pension | 7.38 (4.99...1.91) | |
| Income | P<0.001 | NS |
| I quartile | 2.72 (1.79...4.13) | |
| II quartile | 2.20 (1.46...3.31) | |
| III quartile | 1.63 (1.07...2.50) | |
| IV quartile | 1.00 | |
| Self-rated health | P<0.001 | NS |
| Very good or good | 1.00 | |
| Average | 2.83 (2.01...4.00) | |
| Very low or low | 10.17 (6.80...15.20) | |
| Health status | P<0.001 | P<0.001 |
| Healthy | 1.00 | 1.00 |
| Health disorders | 2.04 (1.30...3.22) | 1.44 (0.87...2.38) |
| Serious health disorders | 6.79 (4.31...10.71) | 2.93 (1.72...5.00) |
| Disability | 11.71 (7.39...18.56) | 2.58 (1.45...4.60) |
| Previous depression episode | P<0.001 | P<0.001 |
| No | 1.00 | 1.00 |
| Yes | 19.64 (13.69...28.18) | 4.16 (2.98...5.80) |
| Current depression episode | P<0.001 | P<0.001 |
| No | 1.00 | 1.00 |
| Yes | 16.84 (12.73...22.26) | 10.16 (6.92...14.91) |

* – adjusted for age and sex; ** – adjusted simultaneously for all factors

5.3. 12-month help-seeking and associated sociodemographic factors, health status indicators, and social support and depression treatment among depressed persons (Publications II and III)

From 343 depressed persons 34.1% (S.E.=0.026; 95% CI 29.07...39.15) sought help during last 12 months. 24.2% of them sought help from GP, 17.8% from psychiatrist and 6.4% from psychologist. Among 117 depressed help-seekers 70.9% sought help from GP, 52.1% from psychiatrist and 18.8% from psychologist; 6% did not receive any treatment, 89.7% received pharmacotherapy, 18.8% psychotherapy, 15.5% pharmacotherapy and psychotherapy. The treatment gap of depression was 67.9%.

During last 12 months 82.2% of depressed persons visited their GP (during last 4 weeks 44.0%), 27.4% made emergency call, 10.5% made an EMD visit

and 2.38% had in-patient treatment. When adjusted for age, sex and somatic disease depressed persons' odds of visiting family doctor were 1.42 (95% CI 1.06...1.90), for emergency call 2.80 (95% CI 2.15...3.64), for EMD visit 1.20 (95% CI 0.84...1.73) and for in-patient treatment 2.10 (95% CI 1.62...2.73) compared with non-depressed persons. 84.3% (SE = 0.197; 95% CI 80.38–88.13) of depressed persons reported chronic somatic disease. Of the depressed persons 95% had valid health insurance.

Results from logistic regression analyses about 12-month help-seeking for emotional problems and associated sociodemographic and health status factors in the depressed sample are presented in Table 3. The odds of 12-month help-seeking were higher in the age groups of 25–34 years and 45–54 years, among groups of people with a disability pension, low self-rated health, a serious health disorder, or a disability. The only factor that remained significant in the multivariate model was severity of the depressive episode.

Table 3. Associations between help-seeking for emotional problems during the previous 12 months and socio-demographic and health factors in major depression sample: results from logistic regression

| Factor | Model 1* | Model 2** |
|-----------------------------|--------------------------|-------------|
| | OR (95% CI) ^a | OR (95% CI) |
| Gender | NS | NS |
| Age | P=0.02 | NS |
| 18–24 | 1.00 | |
| 25–34 | 6.42 (1.23...33.56) | |
| 35–44 | 3.04 (0.56...16.46) | |
| 45–54 | 6.21 (1.25...30.90) | |
| 55–64 | 4.53 (0.92...22.22) | |
| 65–74 | 2.89 (0.61...13.74) | |
| 75–84 | 2.17 (0.46...10.33) | |
| Ethnicity | NS | |
| Urban/rural resident | NS | |
| Marital status | NS | |
| Education | NS | |
| Employment status | P=0.002 | NS |
| Working | 1.00 | |
| Non-working | 0.77 (0.29...2.04) | |
| Retired | 0.79 (0.32...1.94) | |
| Disability pension | 2.88 (1.35...6.13) | |
| Income | NS | |
| Self-rated health | P=0.009 | NS |
| Very good or good | 1.00 | |
| Average | 1.55 (0.58...4.12) | |
| Very low or low | 3.45 (1.21...9.81) | |

| Factor | Model 1* | Model 2** |
|---------------------------------------|--------------------------|--------------------|
| | OR (95% CI) ^a | OR (95% CI) |
| Health status | P=0.001 | |
| Healthy | 1.00 | |
| Health disorders | 0.82 (0.20...3.37) | |
| Serious health disorders | 5.90 (1.74...19.96) | |
| Disability | 4.89 (1.43...16.74) | |
| Previous depression episode | NS | |
| Severity of depression episode | P<0.000 | |
| | 1.49 (1.23...1.82) | 1.48 (1.20...1.82) |

* – adjusted for age and sex; ** – adjusted simultaneously for all factors

In present study we did not find any significant association between structural or functional factors of social support and help-seeking of depressed persons (Publication III, Table 2). A higher external locus of control was associated with an increase in the reporting of help seeking behaviour. There were three significant interactions in the depressed group (Publication III, Table 3)

First, emotional loneliness was associated with higher rate of help-seeking in persons with more external locus of control but not in persons with more internal locus of control (Figure 2).

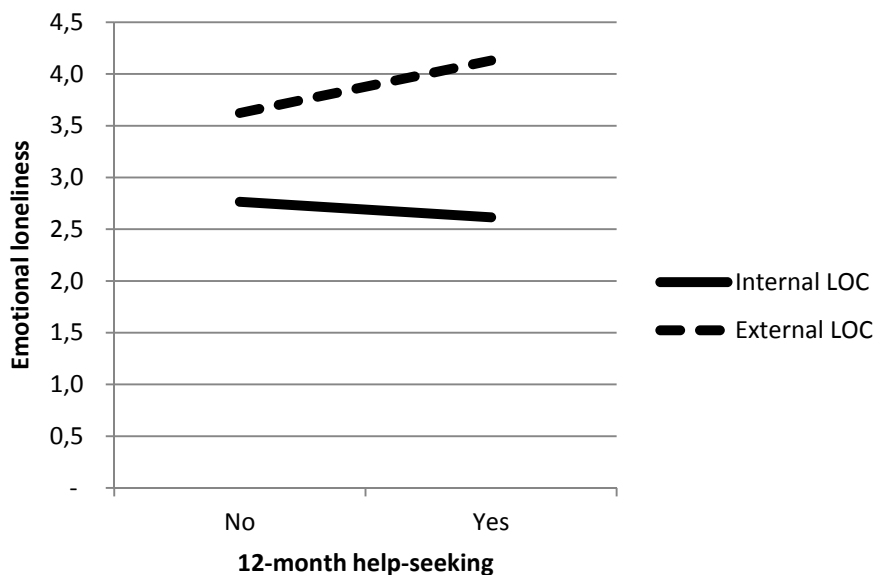
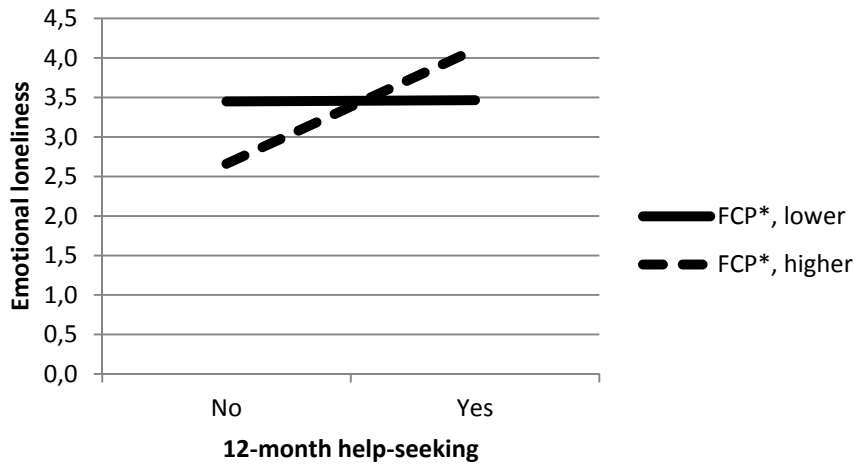


Figure 2. 12-month help-seeking in the depressed sample; interaction between emotional loneliness and locus of control.

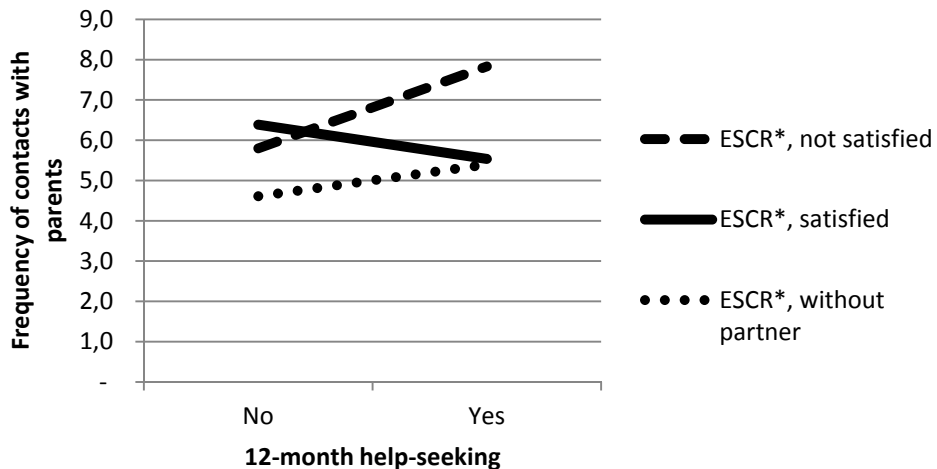
Second, persons with high emotional loneliness reported more help-seeking behaviours if they had more frequent contacts with parents and siblings (Figure 3).



* – frequency of contacts with parents

Figure 3. 12-month help-seeking in the depressed sample; interaction between emotional loneliness and frequency of contacts with parents.

Third, persons who were dissatisfied with their couple relationship were more likely to seek help if they had more frequent contacts with their parents and siblings (Figure 4).



* – emotional satisfaction with couple relations

Figure 4. 12-month help-seeking in the depressed sample; interaction between frequency of contacts with parents and emotional satisfaction with couple relations.

6. DISCUSSION

6.1. Depression prevalence and associated factors

6.1.1. Depression prevalence

Rapid political changes, low average income, rather high social inequality and mortality level (Human Development Report, 2010), which usually increase the risk of depression, suggest that depression prevalence in Estonia could be significantly higher compared to the so-called old European countries.

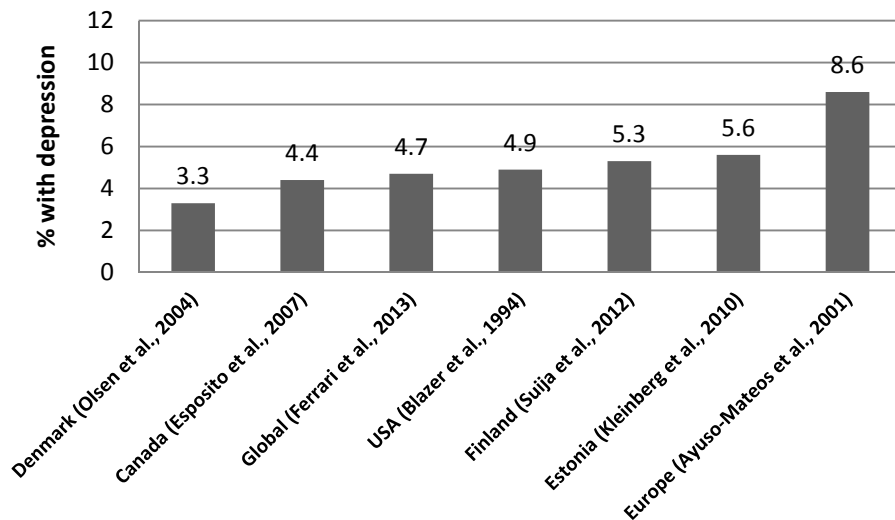


Figure 5. Depression prevalence in different studies

The study confirmed that Estonian depression point prevalence of 5.6% is rather similar (Publication I) to the global point prevalence (average point prevalence based on studies over the world) estimates (Ferrari et al., 2013). In comparison with larger population studies the Estonian depression prevalence rate is slightly higher (Blazer et al., 1994; Esposito et al., 2007) or rather similar (Hasin et al., 2005) (Figure 5).

Depression prevalence data can be affected by methodological and regional differences (Ferrari et al., 2013). From the methodological point of view, one can not compare the results of the present study with studies using self-rating questionnaires, which have shown rather high levels of depression (Bobak et al., 2006). The population studies where a similar methodology was used but which were conducted in different regions showed a slightly lower prevalence rate (Esposito et al., 2007). The data from a close region where a similar methodology was used confirm a rather similar level of depression (5.3%) (Suija et al., 2012).

6.1.2. Association of depression with sociodemographic factors, health status indicators, and social support

Gender

The findings of the present study about the association between depression and gender do not differ from previous studies, which found that women have more depression than men (Fryers et al., 2004; Aromaa et al., 2011). The etiological model of depression takes simultaneously into account the social, psychological, and biological variables (Accortt et al., 2008). Most depression risk factors have a stronger impact in women. Possible significant risk factors in the context of this study include the social disadvantage of women (Noble, 2005), poor health conditions (Gadalla, 2010), and low levels of social support (Leach et al., 2008). In Estonia the salary level of women is lower than the average. Over the years, women's gross wages and salaries accounted for 83–86% of the average gross wages and salaries (Krusell and Värk, 2008). Lower income of women could be a risk factor for depression in Estonian women. As the significance of gender disappeared when health status factors and income were accounted for, the higher depression level in women in this study could be associated with their poor health condition and economic disadvantage.

Income, education, and employment status

Income was the only significant independent indicator of social disadvantage in the present study. There was no independent association between depression and the level of education and employment status. Lack of a significant association between depression and education has also been found previously (Patten et al., 2006; Blay et al., 2007). Education, employment, and material circumstances are three indicators of social disadvantage, which should be analysed together (Fryers et al., 2005).

A remarkable difference in the risk of depression was found between the low-income group and the high-income group and an equally high risk in all three lower-income quartiles. Significant relationship between depression and income has been confirmed earlier (Hasin et al., 2005; Paykel et al., 2005; Fryers et al., 2005; Patten et al., 2006; Blay et al., 2007; Kosidou et al., 2011). One explanation of the findings of the present study could be the effect of country-level relative deprivation in combination with high social inequality, which is similar to a previous study (Ladin et al., 2010). It has been found that the importance of income in association with depression is not necessarily associated with differences in the perceived sufficiency of income (Mikolajczyk et al., 2008). Greater income inequality could be more important (Steptoe et al., 2007), especially if a country is generally rather well developed (Cifuentes et al., 2008). The Eurostat Gini coefficient, an indicator of income inequality, varied between 33 and 37 in Estonia in 2000–2006 (Eurostat 2010), which suggests a rather high level of inequality. The findings of earlier studies (Kopp et al., 2000; Wang et al., 2010) indicate that particular association of depression, income, education, and employment status could depend on their combination with age and circumstances of a particular society. For example, difficulties in

the integration of elderly unemployed persons with a low educational level into the Estonian labour market could pose a combined risk factor for depression for this age group and not the previously mentioned factors separately.

Marital status

Our study confirmed similarly to previous findings that living alone (Smits et al., 2008) or changes in partnership have an important association with depression. Having no cohabitant because of a single status (Anseau et al., 2008) or divorce (Hasin et al., 2007) increased the prevalence of depression in the present study similarly to previous studies. Widowhood had the strongest negative effect also in this study (Onrust and Cuijpers, 2006; Hasin et al., 2005). We can support the theory that marriage has protective effects for survival, as was claimed in an earlier study (Rendall et al., 2011).

Urban-rural residency

The prevalence of depression is higher among the urban population. This has been found also in earlier studies (Wang, 2004; Romans et al., 2011), but because of methodological reasons one should be cautious when comparing their data with the data of the present study. First of all, Estonian cities are relatively small compared to other European countries (ESPON, 2006). Another controversy arises from an earlier Estonian study (Aluoja et al., 2004), which did not confirm this result. The different result of this study could be explained by constantly increasing urbanization of Estonia. During the past 10 years Estonia has witnessed the tendency for movement from rural areas to urban areas. This is mostly because of such social reasons as unemployment but also because of better social infrastructure of urban areas. This could have changed also the sociodemographic characteristics of urban inhabitants. The higher level of urban depression could be associated with concentration of persons who are emotionally or economically in a weaker situation. Stronger social welfare systems of bigger cities also attract persons who continue to stay unemployed and have social problems. It has been argued that various sociodemographic factors are more powerful predictors of difference in depression prevalence than the location of residence. Possible interactions between the sociodemographic factors and residence could be more significant than the place of living (Judd et al., 2002). Higher socio-economic vulnerability is a common risk factor for depression, which could also explain the result of this study concerning the association between urban residency and depression.

Age

The data of the present study show a clear association between depression and age, but the direction of this association could be blurred by other factors. At first sight the present study has similar results with studies showing that the risk of depression increases with age (Kopp et al., 2000; Kolchakova and Akabaliev, 2003; Aluoja et al., 2004) and differs from others by showing opposite results (Patten, 2001; Aromaa et al., 2011). However, when the effect of the socio-

demographic and health factors were considered together with age, then the association of age and depression was reversed.

A previous Estonian study suggested that depressive symptoms and major depression could have a different relationship to age (Aluoja et al., 2004). It could well be possible that self-rating of depressive symptoms (Kolchakova and Akabaliev, 2003; Aluoja et al., 2004) could be more sensitive to stress factors in old age. However, the most obvious explanation of differences from the previous study (Aluoja et al., 2004) is that the present study included health status factors.

Kessler et al. (2010) concluded in a WHO study analysing data from 18 countries that in developed countries MDE is less prevalent among older than younger persons, but non-developed countries revealed a reverse association, which they could not fully explain. The data of the present study indicate that income and health status could explain the controversial association between depression and age. When this study took into account the effects of income, health indicators, and sociodemographic factors, the association between age and depression changed. The risk of depression decreased with increased age. The data of this study support an earlier finding that the association of age and depression will change when those factors that could be changed (for example, low income, poor health, or low social support) are analysed simultaneously (Blazer et al., 1991). In the present study “the masking effect of other risk factors that vary with age” (Jorm, 2000, p.11) could most probably be associated with poor health status and low income. Those factors were significant predictors of depression and have been found to be important risk factors for depression in the population above 40 years (Kopp et al., 2000) or generally in later life (Koenig and Blazer, 1992). The sample of the present study revealed a high level of the chronic somatic disorder and the disability rate. The prevalence of cardiovascular and cognitive disorders among Estonian elderly persons has been found to be much higher than elsewhere in Europe (Saks et al., 2001). However, some studies (Kessler et al. 2010) argue against the importance of somatic disorders in elderly depression. They suggest that despite the increasing prevalence of chronic physical conditions with age in both the developed and the developing countries, the association between depression and chronic conditions generally decreases with age. However, this pattern is less consistent in the developing countries. According to the Human Development Index (HDI), Estonia is officially not a non-developed country anymore. Still, the results of the present study about the association between depression and age, income and health factors could show the status of a developing country. This idea is supported by a rather high age-standardized mortality rate compared with countries which show ‘good results’ both in HDI and mortality (Human Development Report, 2010). On the basis of some previous studies (Bobak et al., 2006; Kopp et al., 2000; Schöllgen et al., 2010; Bromet et al., 2011) one could suggest that coping with financial and health status challenges could be harder for the older population in Estonia, which leads to an increase in depression prevalence.

Ethnicity

The higher depression level of non-Estonians could be associated with their poorer coping ability and lower possibilities to control their life. A European study (Missinne and Bracke, 2012) found that the socio-economic conditions and the experience of ethnic discrimination are important risk factors for a higher depression level among ethnic minorities. Political and economic upheaval with considerable alcohol consumption has led to higher mortality of non-Estonians (Leinsalu et al., 2004). In this study economic challenges and alcohol consumption explain the association of ethnicity and depression only partially. One important factor in this context could be the disappearance of previous social structures (Bobak et al., 2006). An Estonian study conducted ten years ago yielded the same results concerning a higher depression level among the ethnic minority (Aluoja et al., 2004). It is likely that the factors associated with depression among non-Estonians may not have changed in the meanwhile. This suggests a continuing low level of social integration of non-Estonians, partly due to linguistic and sociocultural differences. This could lead to low perceived control over life events, which is an important risk factor for health inequality including depression (Bailis et al., 2001)

Health status

The present study suggests that the association between depression and low health status is highly significant across age and gender. More than three-quarters of depressed persons reported the presence of a chronic somatic disorder (Publication II), and it seems to have a great impact on depression prevalence. Comparison of the co-morbidity level of somatic disorder with other studies (Yates et al., 2004) could be biased because of possible methodological differences and especially because of self-reporting about health disorders in the present study.

The result of this study that poor health status, low self-rated health, and disability are the most significant factors indicating a higher risk of depression was in accordance with the previous studies. High co-morbidity of depression with CSD (chronic somatic disorder) and the reciprocal nature of their association, which leads to high disability, are well known in other countries (Katon, 2011). The association of heart diseases with depression has been found to have a significant disabling effect (Stegmann et al., 2010). High prevalence of cardiovascular disorders among Estonian elderly persons (Saks et al., 2001) could partly explain the result of this study about the strong association of depression with poor health status and disability.

One consequence of high somatic co-morbidity could be low treatment compliance of depressed persons with co-morbid somatic disorder (Katon, 2011). Persons with low self-perceived health tend to discontinue their treatment for depression earlier (Lenze et al., 2001), and depressed persons do not take care of their somatic disorder (Katon, 2011). The non-active coping style and modest help-seeking attitudes could be possible linking factors between depression and poor health. The data of the present study showed low

help-seeking for depression (Publication II) and an increased use of non-specialised health services by depressed persons. This could indicate that Estonian people do not actively take care of their mental health or have little knowledge of depression symptoms and sources of professional help. Acknowledging the reciprocal association between depression and somatic disorder, one can speculate that low level of depression treatment contributes to low somatic health status and vice versa.

Past depressive episode

Predictive significance of a past depressive episode in this study remained high even when adjusted by social, economic, and general health factors. One possible explanation of the significance of a past depressive episode can be found in the sensitization type of the scar model. According to the sensitization scar model, in the case of each subsequent depressive episode less stress is needed to become depressed, and this is mostly genetically determined (Burcusa and Iacono, 2007). It has been suggested that the kindling process may account for the apparently spontaneous expression of the next depressive episode. It could be explained by the reduction of neuronal tissue until a critical point where normal neurocirculatory functioning is not possible without current medication. This process may result in a fragile system with a higher risk of relapse (Palazidou, 2012).

Every recurrent episode increases also the risk of disability, which could increase the possibility of the next depressive episode. Deterioration of health in recurrent episodes has been found to be significantly greater than in the first-episode depression (Gili et al., 2011; Roca et al., 2011). Recurrency leads to higher medical co-morbidity, higher severity (Roca et al., 2011), and greater disability (Satyanarayana et al., 2009). Apart from the possible disabling effect of the previous depressive episode, one should mention low 12-month help-seeking among depressed persons. Insufficient awareness about depression, the low level of active coping with depression including depression treatment could also explain the importance of the past depressive episode in association with depression. This explanation could be relevant in the light of the sensitization scar model, where medical treatment of depression has a crucial role in breaking the vicious circle.

12-month binge drinking

The results of this study confirm that binge drinking is associated with depression in the general population (Bobak et al., 2006; Paljärvi et al., 2009), and more frequent binge drinking increases the risk of depression (Levola et al., 2011). In this study the association between depression and binge drinking was U-shaped, showing both the significance of non-drinking, drinking in small amounts, as well as frequent drinking. The U-shaped association between drinking patterns and depression was established in earlier studies (Rodgers et al., 2000; O'Donnell et al., 2006; Skogen et al., 2009). The association between abstinence and depression can not be fully explained by somatic illness or

socio-economic status (Skogen et al., 2009). This could be associated with different experience of alcohol use by persons who report no alcohol consumption. Another possibility could be associated with persons who label themselves as abstainers but could be former drinkers, who have a higher risk of depression (Graham et al., 2007). The finding about binge drinking was not significant when analysed together with other health status or socio-economic factors. Some other studies have also reported the higher significance of low income, medical conditions, and role impairment than alcohol misuse in association with depression (Tintle et al., 2011). A probable explanation could be that the mentioned depression risk factors are also alcohol misuse risk factors. Alcohol misuse and depression could be described also as consequences of a general social dysfunction because of analogous stress factors.

Social support

The present study confirms that social support is associated with depression (Publication III) which is in accordance with previous findings (Wade and Kendler, 2000; Kessler et al., 2001; Heikkinen and Kauppinen, 2004; Sinokki et al., 2009). Structural and functional factors of social support were similarly important, which is in line with previous data (Antonucci et al., 1997; Chao, 2011). The data of the present study are indirectly in accordance with the findings claiming that both factor groups are associated with positive affect and functional health (Huxhold et al., 2013). Benson (2012) indicated that the effect of the social network on adjustment and against depression would be indirect and mediated by perceived social support. It could well be that functional and structural factors of social support in association with depression have equal importance but different functions. Structural factors of social support could be seen as a frame consisting of the number of social ties with different persons. The network of social ties creates the basis for mutual exchange of emotional, instrumental, or informational support. Altogether, this could be described as functional factors of social support leading to perception of being needed and loved.

The present study showed that a larger primary network (measured as the size of a household), more frequent contacts with friends, and with one's parents could have a protective effect against depression. This study did not measure the exact composition of a household. Therefore, one can only guess that a household equals a family and suggest that a larger family network could protect against depression. The effect of household size disappeared in simultaneous analysis but the frequency of contacts outside home remained significant. Therefore, the number of persons with whom a person was living in the same household could be a less significant risk factor for depression than the frequency of contacts with friends or the parental network outside the family. In the case of depression, the number of people around a person seems to be less important than the frequency of meeting them. It has been proposed that the network structure (size and frequency of contacts) may stimulate social engagement and emotional support (Huxhold et al., 2013). The positive role of

the network of friends has been found to be associated with higher morale (Litwin, 2001), more frequent contacts (Fiori et al., 2006), and the probable promoting effect on the sense of control (Eklund and Bäckström, 2006). One can not infer any causal relationships because of the cross-sectional design of the present study. However, the findings of this study about the significance of contacts outside home with parents and friends, as well as participation in an organization, could show a higher level of social integration, which increases social efficacy. It has been found that self-efficacy (social efficacy especially among older people) acts as a partial mediator between social relations and depressive symptomatology (Fiori et al., 2006). The result of the present study about the positive effect of frequent contacts could be associated with higher self- and social efficacy, which is one outcome of higher social support. Social support could be protective against depression. The effect of social support probably depends on a particular network type and the frequency of contacts with it, as the functions of networks could be different.

Satisfaction with close relations and loneliness

One must not underestimate the significance of the emotional quality of relations. In this study the significance of the association between depression and non-satisfaction with close relations, and especially between depression and emotional loneliness, was as important as the frequency of contacts with friends. This finding is in line with the data showing that both loneliness and social networks independently affect mood (Golden et al., 2009). The data of the present study show that the size of a close network is not necessarily a social support indicator that affects mood while emotional loneliness or integration with close persons, such as the frequency of contacts with friends, could be more important.

The result supports an earlier suggestion that whether or not one actually receives support is less important for health and adjustment than one's beliefs about its availability (Cohen et al., 2000). The present study confirms the previous findings that loneliness and non-satisfaction with close relations are risk factors for depression (Prince et al., 1997; Heikkinen and Kauppinen, 2004; Mechakra-Tahiri et al., 2010). Both factors have probably a reciprocal association with depression, as has been proposed previously (Hammen and Brennan, 2002; Wade and Kendler, 2000; Patten et al., 2010; Kronmüller et al., 2011). Despite similar significance in association with depression, loneliness describes how person perceives quality of his close relations in a more detailed and personal way than satisfaction with relationships. Loneliness could also be used as a characteristic of emotional status in case a person does not have any close relationships. Therefore, loneliness, and according to this study especially emotional loneliness, which differently from social loneliness remained significant also in multivariate analysis, seems to be a crucial marker of social relationship deficit in association with depression (Prince et al., 1997; Heinrich and Gullone, 2006).

Nevertheless, determinants of loneliness (poor health, small network size, and poor marital quality) (Hawkley and Cacioppo, 2010) are partially analogous to depression risk factors; depression and loneliness have been found to be distinct concepts with reciprocal associations. Emotional loneliness could be a marker of significant emotional and cognitive dysfunction of depressed persons. This idea is supported by a previous finding that loneliness was a strong longitudinal predictor of changes in depressive symptomatology independently of demographic factors, objective social isolation, exposure to life stressors, perceived stress, negative affectivity, or social support (Cacioppo et al., 2010). Also, an earlier study emphasized the subjective functioning of depressive persons described by emotional non-satisfaction with close relations (Aluoja et al., 2004).

Locus of control

Locus of control was a factor that was significantly associated with depression in the present study. Independent significance of LOC in predicting depression has been found in earlier studies (Harris et al., 2003; Wardle et al., 2004). If people feel higher levels of control over their life and perceive higher social support, they are less depressive (Gadalla, 2009). In the context of the present study, where non-Estonians, persons with a lower income and low health status had higher depression prevalence, it could be explained by lower perceived control over life in these persons. External LOC could be a sign of more passive coping styles in stressful situations of a changing society, which could partly explain the association between depression and social and health disadvantages in these sub-groups, which leads to depression. It could be disputable as LOC has been found to be significant in association with depression even when the socio-economic and demographic factors were accounted for (Aluoja et al., 2004). The work of Bailis et al. (2001, p. 1661) supports our idea claiming that the “psychological process, that of perceiving control over life events, underlies social inequality in health.” A sense of responsibility for both success and failure has been found to be associated with low levels of depression (Mirowsky and Ross, 1990). If a person is active in assuming control over life difficulties, he or she has probably less depression.

A more external locus of control has been found to be significantly related to a more chronic or a worse course of depression (Spijker et al., 2001; Harrow et al., 2009). Yang (2006) claimed that that the sense of control is a factor that mediates the effects of disability on increments in depressive symptoms in later life. The mediating effect of control could be also the other way around. The sense of control could affect how actively depressed persons seek help or even more how they cognitively process their failures or successes in treatment. Persons who tend not to seek help or believe that it would not be of any use have also a higher probability of disability due to lack of treatment. A malign course of depression does not necessarily depend on external LOC but on cognitive-emotional dysfunctions due to neurobiological changes of depression,

which lead to the vicious circle of more external LOC, lower coping, and increasing dysfunction of depressed persons.

The cross-sectional nature of the study does not allow making conclusions about causality between different factors and depression.

6.2. Help-seeking for emotional problems and depression

6.2.1. 12-month help-seeking for emotional problems and associated factors in the general population

The prevalence of 12-month help-seeking in the general population

The prevalence of 12-month help-seeking for emotional problems in this study (Publication II) was slightly lower than in a larger European study (Alonso et al., 2004) but generally in the same range. The present study describes the pattern of low help-seeking for emotional problems, which is common all over Europe and elsewhere (Sareen et al., 2005). Possible reasons for low help-seeking in Estonia could not be very different from those discussed in earlier studies.

First, more personal factors, such as stigmatizing attitudes (Mojtabai, 2010) and beliefs about low effectiveness of professional help (Jorm et al., 1997; Kessler et al., 2001; ten Have et al., 2010), could be relevant similarly to the preference to solve the problems on their own (Kessler et al., 2001). Estonian health insurance data show an increasing trend of help-seeking (TAI, 2013), which probably indicates an increasing level of positive personal attitudes towards help-seeking. Personal experience of using the service (Burns et al., 2003; Biddle et al., 2004; Hatchett, 2006; ten Have et al., 2010) and the self-perceived need for help (Sareen et al., 2005; Eisenberg et al., 2007) lead persons to seek help. The low level of help-seeking in Estonia could be explained by lack of awareness about mental health problems and their treatment. This is partly supported by the finding of the present study that younger persons tend to seek more help. It could be associated with better awareness about mental health among younger persons who probably use more modern databases.

The second group of factors associated with help-seeking are connected with access to help (Hämäläinen et al., 2004), including insurance coverage (Wang et al., 2000). Unequal regional access to health services could be associated with low help-seeking. As rural-urban residency had no significance in the present study, one can assume that this is not a highly relevant issue. Estonia is a rather small country with small cities with few inhabitants, which can affect the comparison of the data with international studies. Still, access to health services could pose a problem in Estonia as the possibility to reach professional help has regional differences, which should probably be measured on the county level. Psychiatric health services are more concentrated in northern and southern Estonia but are difficult to access in eastern Estonia or in the islands.

Gender and 12-month help-seeking in the general population

The present study confirmed once again that women seek more help for emotional problems (Bijl and Ravelli, 2000; Oliver et al., 2005; Judd et al., 2007). Explanations could be similar to other studies. Most sociodemographic factors, including gender, lost their significance in help-seeking for emotional problems when the current and past depressive episodes were added to the model. The first explanation for lower help-seeking in Estonian men by comparison with women is that they have less depression.

It has also been found that female attendance to healthcare is associated only with social limitations and access to free healthcare, but male attendance is associated with such factors as embarrassment, limitations in physical activities, marital status, employment status, access to free medical care, location/size of the household, and the educational level (Tedstone Doherty and Kartalova-O'Doherty, 2010). Free access to healthcare is universal for all in Estonia, so this is not relevant when explaining gender differences in help-seeking.

Age and 12-month help-seeking in the general population

In the present study age was the only sociodemographic factor, which did not lose its significance in the multivariate model. This is a rather exceptional result because age is usually not a strong predictor of help-seeking (Bijl and Ravelli, 2000). The results of the study showed that help-seeking increased with decreasing age. The highest help-seeking rate in this study was in the 25–34-year and 55–64-year age groups, which is not very common but has been found in connection with lifetime help-seeking either for depression or anxiety (Roness et al., 2005). First of all, this could be explained by relatively high depression prevalence in both groups in the present study. The first depressive episode appears very often in young adult age (in one's twenties and early thirties). As there could be different associations between age and depression in different age cohorts (Yang, 2006; Brault et al., 2012), this result could be associated with coping resources (Yang, 2006). For younger age groups it could be more difficult to cope with stressful life situations, and therefore they seek more help. Another possibility is that they have a more active coping style with a positive attitude towards help-seeking. A negative attitude does not limit help-seeking in younger age groups, as has been found in the oldest age group (Segal et al., 2005). The latter tend to believe that depression is not a proper reason to seek help (Bristow et al., 2011; Chew-Graham et al., 2012).

Association between ethnicity, income, and education and 12-month help-seeking in the general population

The odds of help-seeking were also high in non-Estonian ethnic groups. The significance of ethnicity as a predictor of service use has been found also earlier (Roy-Byrne et al., 2009). In this study ethnicity lost its significance when health status was added to the model; for this reason, the association between help-seeking and non-Estonian ethnicity could be mostly explained by higher somatic co-morbidity of non-Estonians. Mortality of non-Estonians has been

found to be higher compared to Estonians in previous studies (Leinsalu et al., 2004). As the sociocultural risk factors for depression have not changed during the previous ten years, the severity of chronic emotional problems could be a possible reason for higher help-seeking in this sub-population.

Persons with a lower income sought more help in this study, as has been found earlier (Eisenberg et al., 2007; Diaz-Granados et al., 2010). Low income has been found to be associated with the low level of help-seeking (Wang et al., 2005), but some studies have shown inconsistent (Vasiliadis et al., 2005) or no associations (Bijl and Ravelli, 2000). Low income as a barrier to service access, which has been found to be significant in some situations (Sareen et al., 2007), can not be the reason in Estonia for most of the Estonian population are entitled to universal health insurance. The association between low income and help-seeking is most probably significant because of disability and loss of working efficiency, which leads to a low income. The vicious circle between depression, decreasing health status, and a low income because of disability has probably not lost its significance during the ten years. A possible increase in more serious and combined somatic and mental health problems seems to increase also help-seeking.

Similar to earlier studies (Diaz-Granados et al., 2010), less educated persons sought help for emotional problems more than persons with a higher education. This is different from a study by Bijl and Ravelli (2000), who found that more educated persons are more likely to use mental health care. The WHO study, which analysed data from different regions, showed that less-educated people receive less treatment (Wang et al., 2007).

Taking into account all three previously described factors, one could claim that socially more disadvantaged people tend to seek more help for emotional problems. A possible explanation could be that higher severity of emotional problems or dual diagnosis of mental and somatic health problems cause disability and a lower socio-economic position. Socially disadvantaged sub-groups could have less variety of active coping styles in stressful social or health situations.

Marital status and 12-month help-seeking in the general population

Similarly to earlier studies, the rate of help-seeking in the present study was higher among widows (Judd et al., 2007; Diaz-Granados et al., 2010) and separated persons (Judd et al., 2007; Gudmundsdottir and Vilhjalmsson, 2010; Diaz-Granados et al., 2010). Living alone has been generally found to be significantly associated with treatment (Burns et al., 2003; Bijl and Ravelli, 2000). A larger study found that married people tend to be treated less (Wang et al., 2007). As cohabitation could protect against depression, it could decrease help-seeking. The data of the present study do not give an answer to the question whether being married inhibits help-seeking for emotional problems because depressed persons receive help from their close network. However, the present study indicates that if a person has emotionally satisfactory close relations, he or she seeks less help for their emotional problems.

In the present study all the factors that were associated with higher depression prevalence were also associated with higher help-seeking for emotional problems. Most of all the findings follow the line that people do seek help if they have or have had a mental health problem (Uebelacker et al., 2006; Judd et al., 2007) or an affective disorder (Cole et al., 2008; Mills et al., 2011).

Health status factors and 12-month help-seeking in the general population

Similarly to previous studies, the health factors that had an independent relationship with help-seeking included current (Judd et al., 2007; Cole et al., 2008) and previous depressive episodes (Judd et al., 2007), serious health disorder, and disability (Bijl and Ravelli, 2000; Cole et al., 2008).

Disappearance of the significance of sociodemographic factors when adding health status factors, as multivariate analysis in the present study, has been described previously (Kessler, et al., 2001; Elhai and Ford, 2007). It has been shown that sociodemographic factors are insignificant in the case of a well-accessible healthcare system (Spijker et al., 2001). Estonian healthcare is relatively easily accessible due to the universal health insurance system together with the rapidly developing GP system.

Help-seeking for emotional problems most likely follows the pattern of help-seeking among depressed persons. The importance of disabling chronic illness in help-seeking for depression has been found also earlier, especially among the youngest age group (Haarasilta et al., 2003). In this study poor health status remained significant in association with help-seeking even when the depression rate was taken into account. This could be explained by the effect of low somatic health status on the perceived need for help, which in its turn increases the probability of asking help with emotional problems (Herrman et al., 2002). In this study, apart from the probability of more serious and chronic course of emotional problems, the importance of a previous depressive episode could also be associated with previous experience with mental health help. It has been found to increase the positive attitude towards help-seeking (Dahlberg et al., 2008) and increased health service use (Bijl and Ravelli, 2000).

6.2.2. 12-month help-seeking, depression treatment, and the associated sociodemographic, health status, and social support factors in depressed persons

12-month help-seeking in the depressed population

In the present study only one-third of the depressed persons had sought help during the previous 12 months. The result in this study is lower compared to the previous studies, where it has been found to be around 45% (Spijker et al., 2001) or even twice as high (Bijl and Ravelli, 2000; Wang et al., 2005). At the same time, in the present study help-seeking was rather similarly low in comparison with the general European level of help-seeking for mood disorders (Alonso et al., 2004) and with a study carried out in Finland (Aromaa et al., 2011).

One might suppose that the most obvious explanation of the result of this study could be under- or misdiagnosis of depression (Mitchell et al., 2009). This is supported by the finding, which showed that when a quarter of depressed persons had sought help for emotional problems from their GP during the past 12 months, almost twice as many depressed persons had visited their GP for some reason during the previous four weeks. Even when taking into account different time periods of the depressive episode and help-seeking, one could suggest that almost half of the depressed persons in this study were unaware of their mental health problem or at least did not consider it as a reason to ask for help. It seems that unfortunately depression went unnoticed by the GP of a depressed person during the visit. The finding that depressed persons visit their GP but do not receive depression treatment can be found in earlier studies, for example, GP attenders (Berardi et al., 2002), in a population study (Hämäläinen et al., 2008), or among older persons (Beekman et al., 1997). This could be associated both with avoidance of help-seeking for depression by patients and not noticing depression by doctors because some other disorders draw more attention. Depression symptoms could be overshadowed by somatic symptoms, and therefore GPs do not notice them. Depression accompanied by chronic illness could easily remain undetected and untreated both in younger (Haarasilta *et al.*, 2003) and in older age groups (Kales and Valenstein, 2002). The hypothesis of the masking effect of somatic co-morbidity and patients' avoidance of help for depression is supported by a previous Estonian study of the GP-visiting population. Factors that could explain the low detection level of depressed persons by Estonian GPs, include high somatic co-morbidity and patients' negative attitudes towards depression diagnosis (Ööpik et al., 2006). As the patient's advanced age has been found to increase the depression detection rate in primary care (Wittchen et al., 2001), the reluctance of older people to ask help for the current depression (Wetherell et al., 2004) could be a more valid explanation.

Lack of time for patients could also be one problem leading to a low detection level of depression. Diagnosis of difficult mental health cases needs time and the possibility to ask for additional advice. A higher rate of guideline-consistent treatment has been observed among those who made at least one general medical sector visit for a mental health problem while the highest rates were found among those respondents who made at least one visit to a mental health specialist (Wang et al., 2000). Previous findings also indicate that if a doctor has more time to meet their patients, the treatment quality is higher. Short visits to doctors and the low possibility to consult or to refer patients to a psychiatrist could also affect help-seeking as difficult cases do not receive sufficient attention. Estonian general practitioners have admitted difficulties finding time for the treatment of depressed persons (Ööpik et al., 2006), which is similar elsewhere (Simon et al., 2004; Trude and Stoddard, 2003). The arrangement of outpatient mental health referrals because of the small number of psychiatrists has been found to be another challenge for Estonian GPs (Ööpik et al., 2006), as well for other countries (Trude and Stoddard, 2003).

In the present study most depressed persons had valid health insurance; thus, the financial barrier could not be the reason for the low level of help-seeking, which is different from previous studies (Young et al., 2001; Trude and Stoddard, 2003). Financial difficulties could partly explain the low level of help-seeking from psychologists as psychological help in Estonia is more associated with private practice, where a person has to cover some amount of the service cost.

The finding of seeking help mostly from one's GP was similar to other studies (Burns et al., 2000; Wang et al., 2005; Wang et al., 2007). It has been found that GPs diagnose over half of depression cases in out-patient settings in Estonia (Ööpik et al., 2005). The most important reason could be the high rate of chronic somatic co-morbidity of depressed persons in this study, which leads to higher treatment-seeking from GPs (Uebelacker et al., 2006). High prevalence of a previous depressive episode in this study could probably increase choosing one's GP for help because of previous treatment experience (Dahlberg et al., 2008).

One should note that the level of specialized mental help (psychiatrist and psychologist) in this study was rather low compared to other studies (Svensson et al., 2009). The most obvious reason for the low level of help-seeking from a psychiatrist could be their low number in Estonia. It could also be associated with the finding about higher help-seeking of less educated persons. Use of specialized mental health help has been found to be more associated with a higher educational level (Uebelacker et al., 2006). In this study help-seeking only from a psychologist was similarly low in comparison with other studies (Hämäläinen et al., 2009). This could mean that our possibilities or attitudes towards psychological help are not necessarily different.

Depression treatment

The treatment gap of depression was 67.9%, meaning that almost two-thirds of those who should have depression treatment did not receive it. The result about the treatment gap is higher compared to some studies (Hämäläinen et al., 2008) and the general level of the treatment gap in Europe (Kohn et al., 2004) but rather similar to data from the United Kingdom (Kohn et al., 2004). Depression treatment in different countries could be relatively variable and could depend on particular differences in the healthcare system and drug reimbursement. In this meaning there is no "medium European level", which makes comparison of the associated sociodemographic variables rather difficult.

The most likely reason for the low treatment level could be that depression was not recognized (Mitchell et al., 2009), as discussed earlier. The data of the present study do not allow any comments on the quality of depression treatment. The pharmacotherapy rate of those who received treatment in this study was rather high. According to other studies, approximately 40% of depressed persons were treated with antidepressant medication (Spijker et al., 2001). As the present study did not specify the used medicines, one can not comment on antidepressant use or whether the treatment followed depression treatment

guidelines according to the proposed recommendations. The data of this study about psychopharmacotherapy use (90%) were much higher when compared with psychopharmacotherapy use in ODIN (38%) (McCracken et al., 2006) or in DEPRESS II study (Tylee, 2000). High use of psychopharmacology could also be associated with the significant association between depression and disability in this study. It has been found that functional disability increases the use of psychopharmacology (Tylee, 2000) and depressed persons with a higher disability rate receive more often antidepressant treatment (Hämäläinen et al., 2009).

High psychopharmacotherapy use (89.7%) in present study could also be a sign of the low level of possibilities for psychotherapy. The use of psychotherapy was low (18.8%) and the combination of pharmacotherapy and psychotherapy (15.5%) was the least used treatment. It could be associated with lack of psychotherapists and partly with financial barriers as psychological help in Estonia is more characteristic of private practice, where a person has to cover some amount of service cost.

In this study one quarter of the depressed persons had made emergency calls and had undergone in-patient treatment, a considerable number had made EMD visits for some reason. As prevalence of somatic co-morbidity (84.3%) was high in this study, even when compared to selected populations with depression visiting either a GP or psychiatric services (52.8%) in other studies (Yates et al., 2004), this could have influenced the finding of the present study. It has been found that co-morbid chronic disorder increases the duration of in-patient treatment, emergency room visits (Egede, 2007), use of paramedic services (Koopmans and Lamers, 2006), and general use of healthcare of depressed persons (Stein et al., 2006). In the present study this tendency among depressed persons was up to three times higher compared to non-depressed persons even when accounted for age, sex, and somatic disease (Rowan et al., 2002), which means that one can not explain this result only by high somatic co-morbidity. The work of Koopmans and Lamers (2006) showed that severity of a somatic disorder decreased the tendency to use somatic health services by depressed persons. Non-use of generic services, such as EMD, has been found to be associated with increased social functioning scores (McCracken et al., 2006). In this study depression was significantly associated with disability, which usually decreases also social functioning. Decreased psychosocial functioning could be one explanation of frequent use of non-specialized (non-psychiatric and non-GP) health services. The present study did not measure co-morbidity with anxiety, which has been found to be significant factor in earlier studies (Bijl and Ravelli, 1998), which could increase healthcare demand (Tylee, 2000).

Still, one can speculate that depressed persons in this study tried to seek help, and did it mostly because of low perceived health associated with both somatic disorder and depression. Help-seeking from non-specialized health services could also indicate low awareness of depression symptomatology and low treatment in the Estonian population. It has been reported that undertreatment of depression is associated with excessive use of non-mental health

services (Beekmann et al., 1997). Frequent use of non-specialized help by depressed persons is related to high costs of emergency or in-patient service, which are higher, for example, by comparison with help from GPs (McCracken et al., 2006). Depressed persons probably do not receive depression treatment from emergency services, which leads to an increased level of untreated depression. The costs of untreated depression are considerable (Chisholm et al., 2003; Carta et al., 2003). Frequent use of expensive non-specific healthcare by depressed persons could be associated with uneven regional access and the poorly integrated primary and specialized mental health system, where lack of a psychiatrist is one reason. In summary, low-level access to specialized help for depression leads to unreasonable expenditure.

Sociodemographic and health status factors

The present study is in line with the previous findings indicating that socio-demographic factors do not predict help-seeking for depression (Herrman et al., 2002; Hämäläinen et al., 2004; Roness et al., 2005). The result of this study about age differs from other studies showing that older people seek more help (Aromaa et al., 2011). It was found that younger and middle-aged persons sought more help, and the lowest rate characterized the old and the youngest age groups, which is similar to the study by Kessler et al. (2010). The result about increased help-seeking by middle-aged persons is similar to an earlier Finnish study (Hämäläinen et al., 2004).

Similarly to earlier studies, one could claim that depressed persons seek help for emotional problems when they have poor physical health (Kales and Valenstein, 2002; Koopmans and Lamers, 2006; Cole et al., 2008), disability (Bijl and Ravelli, 2000; Spijker et al., 2001; Hämäläinen et al., 2004), and low perceived health (Burns et al., 2000; Herrman et al., 2002; McCracken et al., 2006; Suija et al., 2009). Severity of depression is a crucial factor in depression help-seeking, which increases help-seeking among depressed persons. Several previous studies reported similar results (Tylee, 2000; Hermann et al., 2002; McCracken et al., 2006; Hämäläinen et al., 2008; Aromaa et al., 2011).

Social support and locus of control

In the present study the structural or functional factors of social support did not reveal any significant associations with help-seeking of depressed persons (Publication III). This differs from the European studies, which show that higher social support either increases or decreases health service use (McCracken et al., 2006; ten Have et al., 2002). The finding of this study is similar to the study by Ng et al. (2008), who also found that help-seeking among depressed persons was not associated with social support. One explanation for the result of this study could be the low level of help-seekers among depressed persons. Thus, the significance of social support was not expressed properly due to the small size of the sample. The social network transmits values and attitudes about help-seeking (Albert et al., 1998). The low level of help-seeking in the Estonian population could also suggest that the network of

depressed persons has rather neutral attitudes towards help-seeking, being neither supportive nor against it.

The present study showed that a higher external locus of control was associated with increased help-seeking of depressed persons. The reason for this could be easier acceptance of outside help by depressed persons with external LOC. Sense of loss of control has been described as a perspective how depressed persons view their condition (Cornford et al., 2007). Seeking for help has been found to be associated with perceived failure of coping strategies (Khan et al., 2007). Thus, the results of the present study suggest that persons with more external LOC give up personal control more easily in order to engage with treatment.

The present study revealed three interesting interactions. First, the study showed that emotional loneliness increased help-seeking of depressed persons with external LOC but not with internal LOC. Knowing that loneliness is associated with perceived lack of control over the outcome (Heinrich and Gullone, 2006), one could argue that loneliness strengthens externality beliefs. If people tend to believe that their personal efforts to change things will fail, they could expect more outside help. Emotionally lonely people with external LOC could find it hard to believe that they can cope with their depression by themselves or receive satisfactory help from the closest network and therefore seek more help from the outside. This could be one explanation of the result of the present study.

Second, depressed persons with high emotional loneliness sought more help if they had more frequent contacts with parents and siblings. Third, persons who were dissatisfied with their couple relationship were more likely to seek help if they had more frequent contacts with their parents and siblings. Loneliness requires the perception that one's relations are not living up to some expectation, which makes emotional loneliness and dissatisfaction with close relations somewhat similar concepts. Therefore, it is possible that interaction between emotional loneliness and unsatisfactory partner relations with frequent contacts with closest relatives has a similar meaning. If depressed persons feel lonely or have unsatisfactory partner relations, they are lacking emotional support, which could be replaced by more frequent parental or sibling relations. The feeling of loneliness or dissatisfaction could increase the perceived need of help, and support from the close network could serve as an encouraging factor to make real attempts to find professional help. The result of the present study could indirectly show that higher social support gained through higher social interaction with the alternative primary network could increase help-seeking in depressed persons. Because of the cross-sectional nature of this study, one could also consider a second option that this result reflects increased emotional loneliness due to frequent but negative interactions with family members (Fernandez Y-Garcia et al., 2012), which leads depressive persons to seek professional help. The finding that the parental network is considered to be a source of guidance (Heinrich and Gullone, 2006), and depressed persons receive

from their family mostly positive social support with information leading to professional help (Griffiths et al., 2011), supports rather the first option.

Additionally, lonely people have been found to seek more help from general health services and especially from emergency departments (Heinrich and Gullone, 2006). It seems that loneliness could modulate coping in depressed persons. The coping strategies of socially lonely and emotionally lonely persons have been found to be different; emotionally lonely persons are more active in solving their problems (Heinrich and Gullone, 2006). Both explanations seem to support each other – more active coping of emotionally lonely depressed persons and the parental network as a source of positive social support lead to increased help-seeking in depressed persons, who are described either as emotionally lonely or not satisfied with emotional relationships.

Considering all three interactions, it seems that emotional loneliness could be crucial factor that leads depressed persons to seek professional help. This could be related to a more active coping style but could be also characteristic of extreme hopelessness should a depressed person not experience the expected emotional quality of close relations.

7. CONCLUSIONS

1. Prevalence of major depression in the Estonian population (5.6%) is comparable with other population surveys, which have been conducted in North America and Western Europe, being a little higher than the average.
2. Age, income, ethnicity, health status, self-rated health, and previous depressive episode were independent associates of depression. Low income and poor health status were the most important correlates of depression in the Estonian population.

Depression is associated with structural (household size, cohabitation, frequency of contacts outside the home with parents and friends, and membership in organizations) and functional factors (emotional and social loneliness, emotional satisfaction with couple relationship) of social support, and locus of control.

3. 12-month help-seeking for emotional problems is low in the general population but comparable with other European studies. Women, non-Estonians, widowed or separated, persons with low levels of education and income, persons with poor somatic health, and younger people seek more help for emotional problems.
4. a) Only one-third of depressed persons sought help during the 12-month period, which is lower by comparison with other European studies.
b) Association of health status factors with help-seeking for depression is more important than sociodemographic factors. Depressed persons seek help for emotional problems when they have poor physical health, disability, and, accordingly, low perceived health. Depression severity is the most important factor, which increased help-seeking among depressed persons.
c) Depressed persons seek more help in the case of more external locus of control.

Neither the structural nor functional factors of social support were independently significant in association with help-seeking of depressed persons. Emotional loneliness increases help-seeking of depressed persons with external LOC; depressed persons with high emotional loneliness or dissatisfaction with their couple relationship were more likely to seek help if they had more frequent contacts with their parents and siblings.

- d) Low level of diagnosis and undertreatment leads to an increased use of expensive but non-specific health services by depressed persons.

A major strength of the study is the large representative sample, which allows estimation of depression prevalence and associated factors on a population level differentiating the results of the present study from many studies, which have concentrated on specific age groups.

8. LIMITATIONS

The cross-sectional nature of the present study is one of its major weaknesses which does not allow to make any causal conclusions concerning the factors associated either with depression or help-seeking. Another difficulty concerns measures of structural and functional factors of social support, which were mandatory part of EHIS 2006 as they were included already in previous Estonian Health Survey methodology. Therefore social support measures used by us were not necessarily the best options to measure this phenomenon, which limited comparisons with studies carried out elsewhere.

9. REFERENCES

- Accortt EE, Freeman MP, Allen JJ. Women and major depressive disorder: clinical perspectives on causal pathways. *J Womens Health (Larchmt)* 2008; 17: 1583–1590.
- Adams KB, Roberts AR, Cole MB. Changes in activity and interest in the third and fourth age: associations with health, functioning and depressive symptoms. *Occup Ther Int* 2011; 18: 4–17.
- Akhtar-Danesh N, Landeen J. Relation between depression and sociodemographic factors. *Int J Ment Health Syst* 2007; 1: 4.
- Albert M, Becker T, McCrone P, Thornicroft G. Social networks and mental health service utilization – a literature review. *Int J Soc Psychiatry* 1998; 44: 248–266.
- Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, de Girolamo G, Graaf R, Demyttenaere K, Gasquet I, Haro JM, Katz SJ, Kessler RC, Kovess V, Lépine JP, Ormel J, Polidori G, Russo LJ, Vilagut G, Almansa J, Arbabzadeh-Bouchez S, Autonell J, Bernal M, Buist-Bouwman MA, Codony M, Domingo-Salvany A, Ferrer M, Joo SS, Martínez-Alonso M, Matschinger H, Mazzi F, Morgan Z, Morosini P, Palacin C, Romera B, Taub N, Vollebergh WA; ESEMeD/MHEDEA 2000 Investigators, European Study of the Epidemiology of Mental Disorders (ESEMeD) Project. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand Suppl* 2004; 21–27.
- Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, de Girolamo G, Graaf R, Demyttenaere K, Gasquet I, Haro JM, Katz SJ, Kessler RC, Kovess V, Lépine JP, Ormel J, Polidori G, Russo LJ, Vilagut G, Almansa J, Arbabzadeh-Bouchez S, Autonell J, Bernal M, Buist-Bouwman MA, Codony M, Domingo-Salvany A, Ferrer M, Joo SS, Martínez-Alonso M, Matschinger H, Mazzi F, Morgan Z, Morosini P, Palacin C, Romera B, Taub N, Vollebergh WA; ESEMeD/MHEDEA 2000 Investigators, European Study of the Epidemiology of Mental Disorders (ESEMeD) Project. Use of mental health services in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand Suppl* 2004; 47–54.
- Aluoja A, Leinsalu M, Shlik J, Vasar V, Luuk K. Symptoms of depression in the Estonian population: prevalence, sociodemographic correlates and social adjustment. *J Affect Disord* 2004; 78: 27–35.
- Andrade L, Caraveo-Anduaga JJ, Berglund P, Bijl RV, De Graaf R, Vollebergh W, Dragomirecka E, Kohn R, Keller M, Kessler RC, Kawakami N, Kiliç C, Offord D, Ustun TB, Wittchen HU. The epidemiology of major depressive episodes: results from the International Consortium of Psychiatric Epidemiology (ICPE) Surveys. *Int J Methods Psychiatr Res* 2003; 12: 3–21.
- Angermeyer MC, Matschinger H, Riedel-Heller SG. What to do about mental disorder-help-seeking recommendations of the lay public. *Acta Psychiatr Scand* 2001; 103: 220–225.
- Angst J. Fortnightly review. A regular review of the long-term follow up of depression. *BMJ* 1997; 315: 1143–1146.
- Ansseau M, Fishler B, Dierick M, Albert A, Leyman S, Mignon A. Socioeconomic correlates of generalized anxiety disorder and major depression in primary care: the GADIS II study (Generalized Anxiety and Depression Impact Survey II). *Depress Anxiety* 2008; 25: 506–513.

- Antonucci TC, Fuhrer R, Dartigues JF. Social relations and depressive symptomatology in a sample of community-dwelling French older adults. *Psychol Aging* 1997; 12: 189–195.
- Aragonès E, Piñol JL, Labad A. Depression and physical comorbidity in primary care. *J Psychosom Res* 2007; 63: 107–111.
- Aromaa E, Tolvanen A, Tuulari J, Wahlbeck K. Personal stigma and use of mental health services among people with depression in a general population in Finland. *BMC Psychiatry* 2011; 31: 11–52.
- Ayuso-Mateos JL, Vázquez-Barquero JL, Dowrick C, Lehtinen V, Dalgard OS, Casey P, Wilkinson C, Lasa L, Page H, Dunn G, Wilkinson G; ODIN Group. Depressive disorders in Europe: prevalence figures from the ODIN study. *Br J Psychiatry* 2001; 179: 308–316.
- Bailis DS, Segall A, Mahon MJ, Chipperfield JG, Dunn EM. Perceived control in relation to socioeconomic and behavioral resources for health. *Soc Sci Med* 2001; 52: 1661–1676.
- Bebbington PE, Brugha TS, Meltzer H, Jenkins R, Ceresa C, Farrell M, Lewis G. Neurotic disorders and the receipt of psychiatric treatment. *Psychol Med* 2000; 30: 1369–1376.
- Bebbington PE, Meltzer H, Brugha TS, Farrell M, Jenkins R, Ceresa C, Lewis G. Unequal access and unmet need: neurotic disorders and the use of primary care services. *Psychol Med* 2000; 30: 1359–1367.
- Beekman AT, Deeg DJ, Braam AW, Smit JH, Van Tilburg W. Consequences of major and minor depression in later life: a study of disability, well-being and service utilization. *Psychol Med* 1997; 27: 1397–1409.
- Benson PR. Network Characteristics, Perceived Social Support, and Psychological Adjustment in Mothers of Children with Autism Spectrum Disorder. *J Autism Dev Disord* 2012; 7.
- Benton T, Staab J, Evans DL. Medical co-morbidity in depressive disorders. *Ann Clin Psychiatry* 2007; 19: 289–303.
- Berardi D, Leggieri G, Ceroni GB, Rucci P, Pezzoli A, Paltrinieri E, Grazian N, Ferrari G. 2002. Depression in primary care. A nationwide epidemiological survey. *Fam Pract* 2002; 19: 397–400.
- Biddle L, Gunnell D, Sharp D, Donovan JL. Factors influencing help seeking in mentally distressed young adults: a cross-sectional survey. *Br J Gen Pract* 2004; 54: 248–253.
- Bijl RV, van Zessen G, Ravelli A. Prevalence of psychiatric disorder in the general population: results of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Soc Psychiatry Psychiatr Epidemiol* 1998; 33: 587–595.
- Bijl RV, Ravelli A. Psychiatric morbidity, service use and need for care in the general population: results of the Netherlands Mental Health Survey and Incidence Study. *Am J Public Health* 2000; 90: 602–607.
- Bijl RV, Ravelli A. Current and residual functional disability associated with psychopathology: findings from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Psychol Med* 2000; 30: 657–668.
- Blazer D, Burchett B, Service C, George LK. The association of age and depression among the elderly: an epidemiologic exploration. *J Gerontol* 1991; 46: 210–215.
- Blazer DG, Kessler RC, McGonagle KA, Swartz MS. The prevalence and distribution of major depression in a national community sample: the National Comorbidity Survey. *Am J Psychiatry* 1994; 151: 979–986.

- Blay SL, Andreoli SB, Fillenbaum GG, Gastal FL. Depression morbidity in later life: prevalence and correlates in a developing country. *Am J Geriatr Psychiatry* 2007; 15: 790–799.
- Bobak M, Pikhart H, Pajak A, Kubinova R, Malyutina S, Sebakova H, Topor-Madry R, Nikitin Y, Marmot M. Depressive symptoms in urban population samples in Russia, Poland and the Czech Republic. *Br J Psychiatry* 2006; 188: 359–365.
- Bolton JM, Robinson J, Sareen J. Self-medication of mood disorders with alcohol and drugs in the National Epidemiologic Survey on Alcohol and Related Conditions. *J Affect Disord* 2009; 115: 367–375.
- Brault MC, Meuleman B, Bracke P. Depressive symptoms in the Belgian population: disentangling age and cohort effects. *Soc Psychiatry Psychiatr Epidemiol* 2012; 47: 903–915.
- Bristow K, Edwards S, Funnel E, Fisher L, Gask L, Dowrick C, Chew Graham C. Help Seeking and Access to Primary Care for People from “Hard-to-Reach” Groups with Common Mental Health Problems. *Int J Family Med* 2011. doi: 10.1155/2011/49063.
- Bromet E, Andrade LH, Hwang I, Sampson NA, Alonso J, de Girolamo G, de Graaf R, Demyttenaere K, Hu C, Iwata N, Karam AN, Kaur J, Kostyuchenko S, Lepine JP, Levinson D, Matschinger H, Medina Mora ME, Oakley Browne M, Posada-Villa J, Viana MC, Williams DR, Kessler RC. Cross-national epidemiology of DSM-IV major depressive episode. *BMC Med* 2011; 26: 9–90.
- Bruffaerts R, Bonnewyn A, Demyttenaere K. Delays in seeking treatment for mental disorders in the Belgian general population. *Soc Psychiatry Psychiatr Epidemiol* 2007; 42: 937–944.
- Buist-Bouwman MA, Ormel J, de Graaf R, Vollebergh WA. Functioning after a major depressive episode: complete or incomplete recovery? *J Affect Disord* 2004; 82: 363–371.
- Burcusa SL, Iacono WG. Risk for recurrence in depression. *Clin Psychol Rev* 2007; 27: 959–985.
- Burns BJ, Ryan Wagner H, Gaynes BN, Wells KB, Schulberg HC. General medical and specialty mental health service use for major depression. *Int J Psych Med* 2000; 30: 127–143.
- Burns T, Eichenberger A, Eich D, Ajdacic-Gross V, Angst J, Rössler W. Which individuals with affective symptoms seek help? Results from the Zurich epidemiological study. *Acta Psychiatr Scand* 2003; 108: 419–426.
- Cacioppo JT, Hawkley LC, Thisted RA. Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychol Aging* 2010; 25: 453–463.
- Cacioppo JT, Hughes ME, Waite LJ, Hawkley LC, Thisted RA. Loneliness as a specific risk factor for depressive symptoms: cross-sectional and longitudinal analyses. *Psychol Aging* 2006; 21: 140–151.
- Carpentier N, White D. Cohesion of the primary social network and sustained service use before the first psychiatric hospitalization. *J Behav Health Serv Res* 2002; 29: 404–418.
- Carta MG, Hardoy MC, Kovess V, Dell’Osso L, Carpiniello B. Could health care costs for depression be decreased if the disorder were correctly diagnosed and treated? *Soc Psychiatry Psychiatr Epidemiol* 2003; 38: 490–492.
- Chao SF. Assessing social support and depressive symptoms in older Chinese adults: a longitudinal perspective. *Aging and Mental Health* 2011; 15: 765–774.

- Chazelle E, Lemogne C, Morgan K, Kelleher CC, Chastang JF, Niedhammer I. Explanations of educational differences in major depression and generalised anxiety disorder in the Irish population. *J Affect Disord* 2011; 134: 304–314.
- Chew-Graham C, Kovandžić M, Gask L, Burroughs H, Clarke P, Sanderson H, Dowrick C. Why may older people with depression not present to primary care? Messages from secondary analysis of qualitative data. *Health Soc Care Community* 2012; 20: 52–60.
- Chisholm D, Diehr P, Knapp M, Patrick D, Treglia M, Simon G; LIDO Group. Depression status, medical comorbidity and resource costs. Evidence from an international study of major depression in primary care (LIDO). *Br J Psychiatry* 2003; 183: 121–131.
- Choi NG, Dinitto DM Heavy/binge drinking and depressive symptoms in older adults: gender differences. *Int J Geriatr Psychiatry* 2011; 26: 860–868.
- Chou KL, Liang K, Sareen J. The association between social isolation and DSM-IV mood, anxiety, and substance use disorders: wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry* 2011; 72: 1468–1476.
- Cifuentes M, Sembajwe G, Tak S, Gore R, Kriebel D, Punnett L. The association of major depressive episodes with income inequality and the human development index. *Soc Sci Med* 2008; 67: 529–539.
- Cobb S. Social support as a moderator of life stress. *Psychosom Med* 1976; 38: 300–314.
- Cohen S, Underwood LG, Gottlieb BH. *Social support measurement and intervention. A guide for health and social scientists*. Oxford University Press, 2000; p. 5–181.
- Cole MG, Dendukuri N. Risk factors for depression among elderly community subjects: a systematic review and meta-analysis. *Am J Psychiatry* 2003; 160: 1147–1156.
- Cole MG, McCusker J, Sewitch M, Ciampi A, Dyachenko A. Health services use for mental health problems by community-living seniors with depression. *Int Psychogeriatr* 2008; 20: 554–570.
- Cooper-Patrick L, Powe NR, Jenckes MW, Gonzales JJ, Levine DM, Ford DE. Identification of patient attitudes and preferences regarding treatment of depression. *J Gen Intern Med* 1997; 12: 431–438.
- Cornford CS, Hill A, Reilly J. How patients with depressive symptoms view their condition: a qualitative study. *Fam Pract* 2007; 24: 358–64.
- Crum RM, Brown C, Liang KY, Eaton WW. The association of depression and problem drinking: analyses from the Baltimore ECA follow-up study. *Epidemiologic Catchment Area. Addict Behav* 2001; 26: 765–773.
- Dahlberg KM, Waern M, Runeson B. Mental health literacy and attitudes in a Swedish community sample – investigating the role of personal experience of mental health care. *BMC Public Health* 2008; 9: 8.
- Daniels K, Guppy A. Stressors, locus of control, and social support as consequences of affective psychological well-being. *J Occup Health Psychol* 1997; 2: 156–174.
- De Jong Gierveld J, Van Tilburg T. The De Jong Gierveld short scales for emotional and social loneliness: tested on data from 7 countries in the UN generations and gender surveys. *Eur J Ageing* 2010; 7: 121–130.
- Diaz-Granados N, Georgiades K, Boyle MH. Regional and individual influences on use of mental health services in Canada. *Can J Psychiatry* 2010; 55: 9–20.
- Dixit AR, Crum RM. Prospective study of depression and the risk of heavy alcohol use in women. *Am J Psychiatry* 2000; 157: 751–758.
- Dowrick CF, Bellón JA, Gómez MJ. GP frequent attendance in Liverpool and Granada: the impact of depressive symptoms. *Br J Gen Pract* 2000; 50: 361–365.

- Eaton WW, Shao H, Nestadt G, Lee HB, Bienvenu OJ, Zandi P. Population-based study of first onset and chronicity in major depressive disorder. *Arch Gen Psychiatry* 2008; 65: 513–520.
- Egede LE. Major depression in individuals with chronic medical disorders: prevalence, correlates and association with health resource utilization, lost productivity and functional disability. *Gen Hosp Psychiatry* 2007; 29: 409–416.
- Eisenberg D, Golberstein E, Gollust SE. Help-seeking and access to mental health care in a university student population. *Med Care* 2007; 45: 594–601.
- Eklund M, Bäckström M. The role of perceived control for the perception of health by patients with persistent mental illness. *Scand J Occup Ther* 2006; 13: 249–256.
- Elhai JD, Ford JD. Correlates of mental health service use intensity in the National Comorbidity Survey and National Comorbidity Survey Replication. *Psychiatr Serv* 2007; 58: 1108–1115.
- ESPON 1.4.1 *The Role of Small and Medium Sized Towns (SMESTO). Final Report.* Österreichisches Institut für Raumplanung (ÖIR). [Internet] 2006. [cited December 2013]. Available from: http://www.espon.eu/export/sites/default/Documents/Projects/ESPON2006Projects/StudiesScientificSupportProjects/SmallMediumCities/fr-1.4.1_revised-full.pdf.
- Esposito E, Wang JL, Adair CE, Williams JV, Dobson K, Schopflocher D, Mitton C, Newman S, Beck C, Barbui C, Patten SB. Frequency and adequacy of depression treatment in a Canadian population sample. *Can J Psychiatry* 2007; 52: 780–789.
- ESTONIAN HEALTH INTERVIEW SURVEY 2006 (EHIS 2006). *Questionnaire. Males.* Tallinn, 2006. Available from: http://www.tai.ee/images/PDF/Uuringud/ESTHIS_2006_eng_men.pdf.
- European Commission. Statistical Office of the European Union (Eurostat). *Inequality of income distribution Gini coefficient* [Internet] [updated 2010 May 31; cited 2010 May 31]. Available from: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_sic2&lang=en.
- Fernandez Y-Garcia E, Duberstein P, Paterniti DA, Cipri CS, Kravitz RL, Epstein RM. Feeling labeled, judged, lectured, and rejected by family and friends over depression: cautionary results for primary care clinicians from a multi-centered, qualitative study. *BMC Fam Pract* 2012; 13: 64.
- Ferrari AJ, Somerville AJ, Baxter AJ, Norman R, Patten SB, Vos T, Whiteford HA. Global variation in the prevalence and incidence of major depressive disorder: a systematic review of the epidemiological literature. *Psychol Med* 2013; 43: 471–481.
- Filipčić I, Popović-Grič S, Marcinko D, Basić S, Hotujac L, Pavčić F, Hajnaek S, Aganović I. Screening for depression disorders in patients with chronic somatic illness. *Coll Antropol* 2007; 31: 139–143.
- Fiori KL, Antonucci TC, Cortina KS. Social network typologies and mental health among older adults. *J Gerontol B Psychol Sci Soc Sci* 2006; 61: 25–32.
- Fiori KL, McIlvane JM, Brown EE, Antonucci TC. Social relations and depressive symptomatology: self-efficacy as a mediator. *Aging Ment Health* 2006 May; 10: 227–239.
- Fröjd S, Marttunen M, Pelkonen M, von der Pahlen B, Kaltiala-Heino R. Adult and peer involvement in help-seeking for depression in adolescent population: a two-year follow-up in Finland. *Soc Psychiatry Psychiatr Epidemiol* 2007; 42: 945–952.
- Fryers T, Brugha T, Morgan Z, Smith J, Hill T, Carta M, Lehtinen V, Kovess V. Prevalence of psychiatric disorder in Europe: the potential and reality of meta-analysis. *Soc Psychiatry Psychiatr Epidemiol* 2004; 39: 899–905.

- Fryers T, Melzer D, Jenkins R, Brugha T. The distribution of the common mental disorders: social inequalities in Europe. *Clin Pract Epidemiol Ment Health* 2005; 5: 1–14.
- Gadalla TM. Determinants, correlates and mediators of psychological distress: a longitudinal study. *Soc Sci Med* 2009; 68: 2199–2205.
- Gadalla TM. The role of mastery and social support in the association between life stressors and psychological distress in older Canadians. *J Gerontol Soc Work* 2010; 53: 512–530.
- Gaebel W, Kowitz S, Zielasek J. The DGPPN research project on mental healthcare utilization in Germany: inpatient and outpatient treatment of persons with depression by different disciplines. *Eur Arch Psychiatry Clin Neurosci* 2012; 262 Suppl 2: 51–55.
- Gallagher R, McKinley S. Anxiety, depression and perceived control in patients having coronary artery bypass grafts. *J Adv Nurs* 2009; 65: 2386–2396.
- Gask L, Rogers A, Oliver D, May C, Roland M. Qualitative study of patients' perceptions of the quality of care for depression in general practice. *Br J Gen Pract* 2003; 53: 278–283.
- Gili M, Garcia-Toro M, Vives M, Armengol S, Garcia-Campayo J, Soriano JB, Roca M. Medical comorbidity in recurrent versus first-episode depressive patients. *Acta Psychiatr Scand* 2011; 123: 220–227.
- Glaesmer H, Riedel-Heller S, Braehler E, Spangenberg L, Lupp M. Age- and gender-specific prevalence and risk factors for depressive symptoms in the elderly: a population-based study. *Int Psychogeriatr* 2011; 23: 1294–1300.
- Golberstein E, Eisenberg D, Gollust SE. Perceived stigma and help-seeking behavior: longitudinal evidence from the healthy minds study. *Psychiatr Serv* 2009; 60: 1254–1256.
- Golden J, Conroy RM, Bruce I, Denihan A, Greene E, Kirby M, Lawlor BA. Loneliness, social support networks, mood and wellbeing in community-dwelling elderly. *Int J Geriatr Psychiatry* 2009; 24: 694–700.
- Graham K, Massak A, Demers A, Rehm J. Does the association between alcohol consumption and depression depend on how they are measured? *Alcohol Clin Exp Res* 2007; 31: 78–88.
- Griffiths KM, Crisp DA, Barney L, Reid R. Seeking help for depression from family and friends: a qualitative analysis of perceived advantages and disadvantages. *BMC Psychiatry* 2011; 11: 196.
- Gudmundsdottir G, Vilhjalmsón R. Group differences in outpatient help-seeking for psychological distress: results from a national prospective study of Icelanders. *Scand J Public Health* 2010; 38: 160–167.
- Gunn JM, Ayton DR, Densley K, Pallant JF, Chondros P, Herrman HE, Dowrick CF. The association between chronic illness, multimorbidity and depressive symptoms in an Australian primary care cohort. *Soc Psychiatry Psychiatr Epidemiol* 2012; 47: 175–184.
- Haarasilta L, Marttunen M, Kaprio J, Aro H. Major depressive episode and health care use among adolescents and young adults. *Soc Psychiatr Psychiatr Epidemiol* 2003; 38: 366–372.
- Hammen C, Brennan PA. Interpersonal dysfunction in depressed women: impairments independent of depressive symptoms. *J Affect Disord* 2002; 72: 145–156.
- Hardeveld F, Spijker J, De Graaf R, Nolen WA, Beekman AT. Prevalence and predictors of recurrence of major depressive disorder in the adult population. *Acta Psychiatr Scand* 2010; 122: 184–191.

- Harris T, Cook DG, Victor C, Rink E, Mann AH, Shah S, DeWilde S, Beighton C. Predictors of depressive symptoms in older people—a survey of two general practice populations. *Age Ageing* 2003; 3: 510–518.
- Harrow M, Hansford BG, Astrachan-Fletcher EB. Locus of control: relation to schizophrenia, to recovery, and to depression and psychosis—A 15-year longitudinal study. *Psychiatry Res* 2009; 168: 186–192.
- Hasin DS, Goodwin RD, Stinson FS, Grant BF. Epidemiology of major depressive disorder: results from the National Epidemiologic Survey on Alcoholism and Related Conditions. *Arch Gen Psychiatry* 2005; 62: 1097–1106.
- Hatchett GT. Additional validation of the attitudes toward Seeking Professional Psychological Help Scale. *Psychol Rep* 2006; 98: 279–284.
- Hawkley LC, Cacioppo JT. Loneliness matters: a theoretical and empirical review of consequences and mechanisms. *Ann Behav Med*. 2010; 40: 218–227.
- Hawthorne G. Perceived social isolation in a community sample: its prevalence and correlates with aspects of peoples' lives. *Soc Psychiatry Psychiatr Epidemiol* 2008; 43: 140–150.
- Heath RL, Saliba M, Mahmassani O, Major SC, Khoury BA. Locus of control moderates the relationship between headache pain and depression. *J Headache Pain* 2008; 9: 301–308.
- Heikkinen RL, Kauppinen M. Depressive symptoms in late life: a 10-year follow-up. *Arch Gerontol Geriatr* 2004; 38: 239–250.
- Heinrich LM, Gullone E. The clinical significance of loneliness: a literature review. *Clin Psychol Rev* 2006; 26: 695–718.
- Herrman H, Patrick DL, Diehr P, Martin ML, Fleck M, Simon GE, Buesching DP. Longitudinal investigation of depression outcomes in primary care in six countries: the LIDO study. Functional status, health service use and treatment of people with depressive symptoms. *Psychol Med* 2002; 32: 889–902.
- Hickie IB, Luscombe GM, Davenport TA, Burns JM, Highet NJ. Perspectives of young people on depression: awareness, experiences, attitudes and treatment preferences. *Early Intervention Psychiatry* 2007; 1: 333–339.
- Holma KM, Holma IA, Melartin TK, Rytsälä HJ, Isometsä ET. Long-term outcome of major depressive disorder in psychiatric patients is variable. *J Clin Psychiatry* 2008; 69: 196–205.
- Human Development Report 2010 20th Anniversary Edition. The Real Wealth of Nations: Pathways to Human Development.* United Nations Development Programme (UNDP), 2010. [cited December 2013]. Available from: http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf.
- Hutner NL, Locke SE. Health locus of control: a potential moderator variable for the relationship between life stress and psychopathology. *Psychother Psychosom* 1984; 41: 186–194.
- Huxhold O, Fiori KL, Windsor TD. The Dynamic Interplay of Social Network Characteristics, Subjective Well-Being, and Health: The Costs and Benefits of Socio-Emotional Selectivity. *Psychol Aging* 2013; 28: 3–16.
- Hämäläinen J, Isometsä E, Laukkala T, Kaprio J, Poikolainen K, Heikkinen M, Lindeman S, Aro H. Use of health services for major depressive episode in Finland. *J Affect Disord* 2004; 79: 105–112.
- Hämäläinen J, Isometsä E, Sihvo S, Kiviruusu O, Pirkola S, Lönnqvist J. Treatment of major depressive disorder in the Finnish general population. *Depress Anxiety* 2009; 26: 1049–1059.

- Hämäläinen J, Isometsä E, Sihvo S, Pirkola S, Kiviruusu O. Use of health services for major depressive and anxiety disorders in Finland. *Depress Anxiety* 2008; 25: 27–37.
- Hämäläinen J, Poikolainen K, Isometsä E, Kaprio J, Heikkinen M, Lindeman S, Aro H. Major depressive episode related to long unemployment and frequent alcohol intoxication. *Nord J Psychiatry* 2005; 59: 486–491.
- Jagdeo A, Cox BJ, Stein MB, Sareen J. Negative attitudes toward help seeking for mental illness in 2 population-based surveys from the United States and Canada. *Can J Psychiatry* 2009; 54: 757–766.
- Jefferis BJ, Nazareth I, Marston L, Moreno-Kustner B, Bellón JÁ, Svab I, Rotar D, Geerlings MI, Xavier M, Goncalves-Pereira M, Vicente B, Saldivia S, Aluoja A, Kalda R, King M. Associations between unemployment and major depressive disorder: evidence from an international, prospective study (the predict cohort). *Soc Sci Med* 2011; 73: 1627–1634.
- Jorm AF, Korten AE, Jacomb PA, Christensen H, Rodgers B, Pollitt P. "Mental health literacy": a survey of the public's ability to recognise mental disorders and their beliefs about the effectiveness of treatment. *Med J Aust* 1997; 166: 182–186.
- Jorm AF. Does old age reduce the risk of anxiety and depression? A review of epidemiological studies across the adult life span. *Psychol Med* 2000; 30: 11–22.
- Judd F, Jackson H, Komiti A, Murray G, Fraser C. Service utilisation by rural residents with mental health problems. *Australas Psychiatry* 2007; 15: 185–190.
- Judd FK, Jackson HJ, Komiti A, Murray G, Hodgins G, Fraser C. High prevalence disorders in urban and rural communities. *Aust N Z J Psychiatry* 2002; 36: 104–113.
- Kales HC, Valenstein M. Complexity in late-life depression: impact of confounding factors on diagnosis, treatment, and outcomes. *J Geriatr Psychiatry Neurol* 2002; 15: 147–155.
- Kang SH, Wallace NT, Hyun JK, Morris A, Coffman J, Bloom JR. Social networks and their relationship to mental health service use and expenditures among Medicaid beneficiaries. *Psychiatr Serv* 2007; 58: 689–695.
- Kaplan HI, Sadock BJ. *Synopsis of Psychiatry. Behavioural Sciences/Clinical Psychiatry. Eight edition.* Williams & Wilkins, 1997; p. 544.
- Katon W. Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. *Biol Psychiatry* 2003; 54: 216–226.
- Katon WJ. Epidemiology and treatment of depression in patients with chronic medical illness. *Dialogues Clin Neurosci* 2011; 13: 7–23.
- Keeton CP, Perry-Jenkins M, Sayer AG. Sense of control predicts depressive and anxious symptoms across the transition to parenthood. *J Fam Psychol* 2008; 22: 212–221.
- Kennedy N, Abbott R, Paykel ES. Remission and recurrence of depression in the maintenance era: long-term outcome in a Cambridge cohort. *Psychol Med* 2003; 33: 827–838.
- Kessler RC, Berglund PA, Bruce ML, Koch JR, Laska EM, Leaf PJ, Manderscheid RW, Rosenheck RA, Walters EE, Wang PS. The prevalence and correlates of untreated serious mental illness. *Health Serv Res* 2001; 36: 987–1007.
- Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, Rush AJ, Walters EE, Wang PS. National Comorbidity Survey Replication. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA* 2003; 289: 3095–3105.

- Kessler RC, Merikangas KR, Wang PS. Prevalence, comorbidity, and service utilization for mood disorders in the United States at the beginning of the twenty-first century. *Annu Rev Clin Psychol* 2007; 3: 137–158.
- Kessler RC, Birnbaum HG, Shahly V, Bromet E, Hwang I, McLaughlin KA, Sampson N, Andrade LH, de Girolamo G, Demyttenaere K, Haro JM, Karam AN, Kostyuchenko S, Kovess V, Lara C, Levinson D, Matschinger H, Nakane Y, Browne MO, Ormel J, Posada-Villa J, Sagar R, Stein DJ. Age differences in the prevalence and co-morbidity of DSM-IV major depressive episodes: results from the WHO World Mental Health Survey Initiative. *Depress Anxiety* 2010; 27: 351–364.
- Khan N, Bower P, Rogers A. Guided self-help in primary care mental health: meta-synthesis of qualitative studies of patient experience. *Br J Psychiatry* 2007; 191: 206–211.
- Kivelä SL, Pahlkala K. Depressive disorder as a predictor of physical disability in old age. *J Am Geriatr Soc* 2001; 49: 290–296.
- Kivinen P, Halonen P, Eronen M, Nissinen A. Self-rated health, physician-rated health and associated factors among elderly men: the Finnish cohorts of the Seven Countries Study. *Age Ageing* 1998; 27: 41–47.
- Klineberg E, Biddle L, Donovan J, Gunnell D. Symptom recognition and help seeking for depression in young adults: a vignette study. *Soc Psychiatry Psychiatr Epidemiol* 2011; 46: 495–505.
- Koenig HG, Blazer DG. Epidemiology of geriatric affective disorders. *Clin Geriatr Med* 1992; 8: 235–251.
- Kohn R, Saxena S, Levav I, Saraceno B. The treatment gap in mental health care. *Bull World Health Organisation* 2004; 82: 858–866.
- Kolchakova PY, Akabaliev VH. A study of the effect of age on depressivity in Bulgarian urban population. *Folia Med (Plovdiv)* 2003; 45: 11–15.
- Koopmans GT, Lamers, LM. Is the impact of depressive complaints on the use of general health care services dependent on severity of somatic morbidity? *J Psychosom Res* 2006; 61: 41–50.
- Kopp MS, Skrabski A, Szedmak S. Psychosocial risk factors, inequality and self-rated morbidity in a changing society. *Soc Sci Med* 2000; 51: 1351–1361.
- Kosidou K, Dalman C, Lundberg M, Hallqvist J, Isacson G, Magnusson C. Socioeconomic status and risk of psychological distress and depression in the Stockholm Public Health Cohort: a population-based study. *J Affect Disord* 2011; 134: 160–167.
- Kovess-Masfety V, Saragoussi D, Sevilla-Dedieu C, Gilbert F, Suchocka A, Arveiller N, Gasquet I, Younes N, Hardy-Bayle MC. What makes people decide who to turn to when faced with a mental health problem? Results from a French survey. *BMC Public Health* 2007; 31: 7–188.
- Kronmüller KT, Backenstrass M, Victor D, Postelnicu I, Schenkenbach C, Joest K, Fiedler P, Mundt C. Quality of marital relationship and depression: results of a 10-year prospective follow-up study. *J Affect Disord* 2011; 128: 64–71.
- Kronmüller KT, Victor D, Schenkenbach C, Postelnicu I, Backenstrass M, Schröder J, Mundt C. Knowledge about affective disorders and outcome of depression. *J Affect Disord* 2007; 104: 155–160.
- Krusell S, Värk A. *Socio-economic environment. Children. Statistics Estonia*. Tallinn; 2008. p. 123. [cited September 2013]. Available from: http://rahvatervis.ut.ee/bitstream/1/930/1/ES2008_5.pdf.

- Ladin K, Daniels N, Kawachi I. Exploring the Relationship Between Absolute and Relative Position and Late-Life Depression: Evidence From 10 European Countries. *Gerontologist* 2010; 50: 48–59.
- Leach LS, Christensen H, Mackinnon AJ, Windsor TD, Butterworth P. Gender differences in depression and anxiety across the adult lifespan: the role of psychosocial mediators. *Soc Psychiatry Psychiatr Epidemiol* 2008; 43: 983–998.
- Lecrubier Y, Sheehan DV, Weiller E, Amorim P, Bonora I, Harnett Sheehan K, Janavs J, Dunbar GC. The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI. *Eur Psychiatry* 1997; 12: 224–231.
- Lehtinen V, Sohlman B, Kovess-Masfety V. Level of positive mental health in the European Union: results from the Eurobarometer 2002 survey. *Clin Pract Epidemiol Ment Health* 2005; 21: 1–9.
- Lehtinen V, Sohlman B, Nummelin T, Salomaa M, Ayuso-Mateos JL, Dowrick C. The estimated incidence of depressive disorder and its determinants in the Finnish ODIN sample. *Soc Psychiatry Psychiatr Epidemiol* 2005; 40: 778–784.
- Leinsalu M, Vägerö D, Kunst AE. Increasing ethnic differences in mortality in Estonia after the collapse of the Soviet Union. *J Epidemiol Community Health* 2004; 58: 583–589.
- Lenze EJ, Miller MD, Dew MA, Martire LM, Mulsant BH, Begley AE, Schulz R, Frank E, Reynolds CF 3r. Subjective health measures and acute treatment outcomes in geriatric depression. *Int J Geriatr Psychiatry* 2001; 16: 1149–1155.
- Lépine JP, Briley M The increasing burden of depression. *Neuropsychiatr Dis Treat* 2011; 7: 3–7.
- Lépine JP, Gastpar M, Mendlewicz J, et al. Depression in the community: the first pan-European study DEPRES (Depression Research in European Society). *Int Clin Psychopharmacol* 1997; 12: 19–29.
- Leskelä U, Melartin T, Rytysälä H, Sokero P, Lestelä-Mielonen P, Isometsä E. The influence of major depressive disorder on objective and subjective social support: a prospective study. *J Nerv Ment Dis* 2008; 196: 876–883.
- Levola J, Holopainen A, Aalto M. Depression and heavy drinking occasions: a cross-sectional general population study. *Addict Behav* 2011; 36: 375–380.
- Lindeman S, Hämäläinen J, Isometsä E, Kaprio J, Poikolainen K, Heikkinen M, Aro H. The 12-month prevalence and risk factors for major depressive episode in Finland: representative sample of 5993 adults. *Acta Psychiatr Scand* 2000; 102: 178–184.
- Litwin H. Social network type and morale in old age. *Gerontologist* 2001; 41: 516–524.
- Luijendijk HJ, van den Berg JF, Dekker MJ, van Tuijl HR, Otte W, Smit F, Hofman A, Stricker BH, Tiemeier H. Incidence and recurrence of late-life depression. *Arch Gen Psychiatry* 2008; 65: 1394–1401.
- Maaroos H, Aluoja A, Kalda R. Alkoholi tarvitamise sөлumine ja alkoholi tervist kahjustava tarbimisega seotud riskitegurid perearsti patsientide hulgas Eestis. *Eesti Arst* 2010; 89: 316–322.
- Mackenbach JP, Stirbu I, Roskam AJ, Schaap MM, Menvielle G, Leinsalu M, Kunst AE. European Union Working Group on Socioeconomic Inequalities in Health. Socioeconomic inequalities in health in 22 European countries. *N Engl J Med* 2008; 358: 2468–2481.
- Mackenzie CS, Gekoski WL, Knox VJ. Age, gender, and the underutilization of mental health services: the influence of help-seeking attitudes. *Aging Ment Health* 2006; 10: 574–582.

- Mackenzie CS, Pagura J, Sareen J. Correlates of perceived need for and use of mental health services by older adults in the collaborative psychiatric epidemiology surveys. *Am J Geriatr Psychiatry* 2010; 18: 1103–1115.
- Mathers CD, Bernard C, Moesgaard Iburg K, Inoue M, Ma Fat D, Shibuya K, Stein C, Tomijima N, Hongyi X. *Global Burden of Disease in 2002: data sources, methods and results. Global Programme on Evidence for Health Policy Discussion Paper No. 54, World Health Organization* [Internet]. 2003 [cited May 31]. Available from: www.who.int/entity/healthinfo/paper54.pdf.
- Mauerhofer A, Berchtold A, Michaud PA, Suris JC. GPs' role in the detection of psychological problems of young people: a population-based study. *Br J Gen Pract* 2009; 59: 308–314.
- Maulik PK, Eaton WW, Bradshaw CP. The role of social network and support in mental health service use: findings from the Baltimore ECA study. *Psychiatr Serv* 2009; 60: 1222–1229.
- Maulik PK, Eaton WW, Bradshaw CP. The effect of social networks and social support on mental health services use, following a life event, among the Baltimore Epidemiologic Catchment Area cohort. *J Behav Health Serv Res* 2011; 38: 29–50.
- McCracken C, Dalgard OS, Ayuso-Mateos JL, Casey P, Wilkinson G, Lehtinen V, Dowrick C. Health service use by adults with depression: community survey in five European countries. Evidence from the ODIN study. *Br J Psychiatry* 2006; 189: 161–167.
- Mechakra-Tahiri SD, Zunzunegui MV, Préville M, Dubé M. Gender, social relationships and depressive disorders in adults aged 65 and over in Quebec. *Chronic Dis Can* 2010; 30: 56–65.
- Melartin TK, Rytälä HJ, Leskelä US, Lestelä-Mielonen PS, Sokero TP, Isometsä ET. Severity and comorbidity predict episode duration and recurrence of DSM-IV major depressive disorder. *J Clin Psychiatry* 2004; 65: 810–819.
- Mikolajczyk RT, Maxwell AE, El Ansari W, Naydenova V, Stock C, Ilieva S, Dudziak U, Nagyova I. Prevalence of depressive symptoms in university students from Germany, Denmark, Poland and Bulgaria. *Soc Psychiatry Psychiatr Epidemiol* 2008; 43: 105–112.
- Mills V, Van Hooff M, Baur J, McFarlane AC. Predictors of Mental Health Service Utilisation in a Non-Treatment Seeking Epidemiological Sample of Australian Adults. *Community Ment Health J* 2011; 13.
- Mirowsky J, Ross CE. Control or defense? Depression and the sense of control over good and bad outcomes. *J Health Soc Behav* 1990; 31: 71–86.
- Missinne S, Bracke P. Depressive symptoms among immigrants and ethnic minorities: a population based study in 23 European countries. *Soc Psychiatry Psychiatr Epidemiol* 2012; 47: 97–109.
- Mitchell AJ, Vaze A, Rao S. Clinical diagnosis of depression in primary care: a meta-analysis. *Lancet* 2009; 374: 609–619.
- Moak ZB, Agrawal A. The association between perceived interpersonal social support and physical and mental health: results from the National Epidemiological Survey on Alcohol and Related Conditions. *J Public Health (Oxf)* 2010; 32: 191–201.
- Mojtabai R, Olfson M, Mechanic D. Perceived need and help-seeking in adults with mood, anxiety, or substance use disorders. *Arch Gen Psychiatry* 2002; 59: 77–84.
- Mojtabai R. Americans' attitudes toward mental health treatment seeking: 1990–2003. *Psychiatr Serv* 2007; 58: 642–651.
- Mojtabai R. Unmet need for treatment of major depression in the United States. *Psychiatr Serv* 2009; 60: 297–305.

- Mojtabai R. Mental illness stigma and willingness to seek mental health care in the European Union. *Soc Psychiatry Psychiatr Epidemiol* 2010; 45: 705–712.
- Morgan C, Mallett R, Hutchinson G, Bagalkote H, Morgan K, Fearon P, Dazzan P, Boydell J, McKenzie K, Harrison G, Murray R, Jones P, Craig T, Leff J; AESOP Study Group. Pathways to care and ethnicity. 2: Source of referral and help-seeking. Report from the AESOP study. *Br J Psychiatry* 2005; 186: 290–296.
- Ng TP, Jin AZ, Ho R, Chua HC, Fones CS, Lim L. Health beliefs and help seeking for depressive and anxiety disorders among urban Singaporean adults. *Psychiatr Serv* 2008; 59: 105–108.
- Noble RE. Depression in women. *Metabolism* 2005; 54 (5 Suppl 1): 49–52.
- Nuyen J, Spreeuwenberg PM, Van Dijk L, den Bos GA, Groenewegen PP, Schellevis FG. The influence of specific chronic somatic conditions on the care for co-morbid depression in general practice. *Psychol Med* 2008; 38: 265–277.
- O'Donnell K, Wardle J, Dantzer C, Steptoe A. Alcohol consumption and symptoms of depression in young adults from 20 countries. *J Stud Alcohol* 2006; 67: 837–840.
- Oja L, Matsi A, Leinsalu M. *Estonian Health Interview Survey. Methodological Report*. Tallinn: National Institute for Health Development [Internet]. 2008 [cited May 31]. Available from: http://www2.tai.ee/ETeU/met_51.pdf.
- Oliver MI, Pearson N, Coe N, Gunnell D. Help-seeking behaviour in men and women with common mental health problems: cross-sectional study. *Br J Psychiatry* 2005; 186: 297–301.
- Olsen LR, Mortensen EL, Bech P. Prevalence of major depression and stress indicators in the Danish general population. *Acta Psychiatr Scand* 2004; 109: 96–103.
- Olstad R, Sexton H, Sogaard AJ. The Finnmark Study. A prospective population study of the social support buffer hypothesis, specific stressors and mental distress. *Soc Psychiatry Psychiatr Epidemiol* 2001; 36: 582–589.
- Onrust SA, Cuijpers P. Mood and anxiety disorders in widowhood: a systematic review. *Aging Ment Health* 2006; 10: 327–334.
- Ormel J, Oldehinkel AJ, Nolen WA, Vollebergh W. Psychosocial disability before, during, and after a major depressive episode: a 3-wave population-based study of state, scar, and trait effects. *Arch Gen Psychiatry* 2004; 61: 387–392.
- Oslin DW, Datto CJ, Kallan MJ, Katz IR, Edell WS, TenHave T. Association between medical comorbidity and treatment outcomes in late-life depression. *J Am Geriatr Soc* 2002; 50: 823–828.
- Palazidou E. The neurobiology of depression. *Br Med Bull* 2012; 101: 127–145.
- Paljärvi T, Koskenvuo M, Poikolainen K, Kauhanen J, Sillanmäki L, Mäkelä P. Binge drinking and depressive symptoms: a 5-year population-based cohort study. *Addiction* 2009; 104: 1168–1178.
- Park CL, Sacco SJ, Edmondson D. Expanding coping goodness-of-fit: religious coping, health locus of control, and depressed affect in heart failure patients. *Anxiety Stress Coping* 2012; 25: 137–153.
- Patten SB, Charney DA. Alcohol consumption and major depression in the Canadian population. *Can J Psychiatry* 1998; 43: 502–506.
- Patten SB. Long-term medical conditions and major depression in a Canadian population study at waves 1 and 2. *J Affect Disord* 2001; 63: 35–41.
- Patten SB, Wang JL, Williams JV, Currie S, Beck CA, Maxwell CJ. Descriptive epidemiology of major depression in Canada. *Can J Psychiatry* 2006; 51: 84–90.
- Patten SB, Williams JV, Lavorato DH, Bulloch AG. Reciprocal effects of social support in major depression epidemiology. *Clin Pract Epidemiol Ment Health* 2010; 6: 126–131.

- Patten SB, Williams JV, Lavorato DH, Modgill G, Jetté N, Eliasziw M. Major depression as a risk factor for chronic disease incidence: longitudinal analyses in a general population cohort. *Gen Hosp Psychiatry* 2008; 30: 407–413.
- Paukert AL, LeMaire A, Cully JA. Predictors of depressive symptoms in older veterans with heart failure. *Aging Ment Health* 2009; 13: 601–610.
- Paykel ES, Brugha T, Fryers T. Size and burden of depressive disorders in Europe. *Eur Neuropsychopharmacol* 2005; 5: 411–423.
- Prince MJ, Harwood RH, Blizard RA, Thomas A, Mann AH. Social support deficits, loneliness and life events as risk factors for depression in old age. The Gospel Oak Project VI. *Psychol Med* 1997; 27: 323–332.
- Ramsey SE, Engler PA, Stein MD. Alcohol Use Among Depressed Patients: The Need for Assessment and Intervention. *Prof Psychol Res Pr* 2005; 36: 203–207.
- Rendall MS, Weden MM, Favreault MM, Waldron H. The protective effect of marriage for survival: a review and update. *Demography* 2011; 48: 481–506.
- Rhebergen D, Beekman AT, de Graaf R, Nolen WA, Spijker J, Hoogendijk WJ, Penninx BW. Trajectories of recovery of social and physical functioning in major depression, dysthymic disorder and double depression: a 3-year follow-up. *J Affect Disord* 2010; 124: 148–156.
- Riedel-Heller SG, Matschinger H, Angermeyer MC. Mental disorders--who and what might help? Help-seeking and treatment preferences of the lay public. *Soc Psychiatry Psychiatr Epidemiol* 2005; 40: 167–174.
- Rifel J, Svab I, Pavlič DR, King M, Nazareth I. Longstanding disease, disability or infirmity and depression in primary care. *Wien Klin Wochenschr* 2010; 122: 567–571.
- Roca M, Armengol S, García-García M, Rodríguez-Bayón A, Ballesta I, Serrano MJ, Comas A, Gili M. Clinical differences between first and recurrent episodes in depressive patients. *Compr Psychiatry* 2011; 52: 26–32.
- Rodgers B, Korten AE, Jorm AF, Jacomb PA, Christensen H, Henderson AS. Non-linear relationships in associations of depression and anxiety with alcohol use. *Psychol Med* 2000; 30: 421–432.
- Rogers A, May C, Oliver D. Experiencing depression, experiencing the depressed: the separate worlds of patients and doctors. *J Ment Health* 2001; 10: 317–333.
- Romans S, Cohen M, Forte T. Rates of depression and anxiety in urban and rural Canada. *Soc Psychiatry Psychiatr Epidemiol* 2011; 46: 567–575.
- Roness A, Mykletun A, Dahl AA. Help-seeking behaviour in patients with anxiety disorder and depression. *Acta Psychiatr Scand* 2005; 111: 51–58.
- Rotter J. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs Rotter JB Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs* 1966; 80: 1–28.
- Rowan PJ, Davidson K, Campbell JA, Dobrez DG, MacLean DR. Depressive symptoms predict medical care utilization in a population-based sample. *Psychol Med* 2002; 32: 903–908.
- Roy-Byrne PP, Joesch JM, Wang PS, Kessler RC. Low socioeconomic status and mental health care use among respondents with anxiety and depression in the NCS-R. *Psychiatr Serv* 2009; 60: 1190–1197.
- Rubio JM, Markowitz JC, Alegría A, Pérez-Fuentes G, Liu SM, Lin KH, Blanco C. Epidemiology of chronic and nonchronic major depressive disorder: results from the national epidemiologic survey on alcohol and related conditions. *Depress Anxiety* 2011; 28: 622–631.

- Saks K, Kolk H, Allev R, Soots A, Kõiv K, Paju I, Jaanson K, Schneider G. Health status of the older population in Estonia. *Croat Med J* 2001; 42: 663–668.
- Sandler IN, Lakey B. Locus of control as a stress moderator: the role of control perceptions and social support. *Am J Community Psychol* 1982; 10: 65–80.
- Sareen J, Cox BJ, Afifi TO, Yu BN, Stein MB. Mental health service use in a nationally representative Canadian survey. *Can J Psychiatry* 2005; 50: 753–761.
- Sareen J, Cox BJ, Afifi TO, Clara I, Yu BN. Perceived need for mental health treatment in a nationally representative Canadian sample. *Can J Psychiatry* 2005; 50: 643–651.
- Sareen J, Jagdeo A, Cox BJ, Clara I, ten Have M, Belik SL, de Graaf R, Stein MB. Perceived barriers to mental health service utilization in the United States, Ontario, and the Netherlands. *Psychiatr Serv* 2007; 58: 357–364.
- Satre DD, Sterling SA, Mackin RS, Weisner C. Patterns of alcohol and drug use among depressed older adults seeking outpatient psychiatric services. *Am J Geriatr Psychiatry* 2011; 19: 695–703.
- Satyanarayana S, Enns MW, Cox BJ, Sareen J. Prevalence and correlates of chronic depression in the Canadian community health survey: mental health and well-being. *Can J Psychiatry* 2009; 54: 389–398.
- Schmitz N, Wang J, Malla A, Lesage A. Joint effect of depression and chronic conditions on disability: results from a population-based study. *Psychosom Med* 2007; 69: 332–338.
- Schomerus G, Matschinger H, Angermeyer MC. Attitudes that determine willingness to seek psychiatric help for depression: a representative population survey applying the Theory of Planned Behaviour. *Psychol Med* 2009; 39: 1855–1865.
- Schöllgen I, Huxhold O, Tesch-Römer C. Socioeconomic status and health in the second half of life: findings from the German Ageing Survey. *Eur J Ageing* 2010; 7: 17–28.
- Segal DL, Coolidge FL, Mincic MS, O’Riley A. Beliefs about mental illness and willingness to seek help: a cross-sectional study. *Aging Ment Health* 2005; 9: 363–367.
- Simon GE, Fleck M, Lucas R, Bushnell DM, LIDO Group. Prevalence and predictors of depression treatment in an international primary care study. *Am J Psychiatry* 2004; 161: 1626–1634.
- Sinokki M, Hinkka K, Ahola K, Koskinen S, Kivimäki M, Honkonen T, Puukka P, Klaukka T, Lönnqvist J, Virtanen M. The association of social support at work and in private life with mental health and antidepressant use: the Health 2000 Study. *J Affect Disord* 2009; 115: 36–45.
- Skaff MM. *Sense of control and health: A dynamic duo in the aging process*. In: Aldwin C, Park C, Spiro A, editors. *Handbook of health psychology and aging*. New York: Guilford Press; 2007. p. 186–209.
- Skogen JC, Harvey SB, Henderson M, Stordal E, Mykletun A. Anxiety and depression among abstainers and low-level alcohol consumers. The Nord-Trøndelag Health Study. *Addiction* 2009; 104: 1519–1529.
- Smits F, Smits N, Schoevers R, Deeg D, Beekman A, Cuijpers P. An epidemiological approach to depression prevention in old age. *Am J Geriatr Psychiatry* 2008; 16: 444–453.
- Spijker J, Bijl RV, de Graaf R, Nolen WA. Care utilization and outcome of DSM-III-R major depression in the general population. Results from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Acta Psychiatr Scand* 2001; 104: 19–24.

- Spijker J, Bijl RV, de Graaf R, Nolen WA. Determinants of poor 1-year outcome of DSM-III-R major depression in the general population: results of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Acta Psychiatr Scand* 2001; 103: 122–130.
- Spijker J, de Graaf R, Bijl RV, Beekman AT, Ormel J, Nolen WA. Duration of major depressive episodes in the general population: results from The Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Br J Psychiatry* 2002; 181: 208–213.
- Spijker J, de Graaf R, Bijl RV, Beekman AT, Ormel J, Nolen WA. Determinants of persistence of major depressive episodes in the general population. Results from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *J Affect Disord* 2004; 81: 231–240.
- Stegmann ME, Ormel J, de Graaf R, Haro JM, de Girolamo G, Demyttenaere K, Kovess V, Matschinger H, Vilagut G, Alonso J, Burger H; ESEMED/MHEDEA Investigators. Functional disability as an explanation of the associations between chronic physical conditions and 12-month major depressive episode. *J Affect Disord* 2010; 124: 38–44.
- Stein MB, Cox BJ, Afifi TO, Belik SL, Sareen J. Does co-morbid depressive illness magnify the impact of chronic physical illness? A population-based perspective. *Psychol Med* 2006; 36: 587–596.
- Stephoe A, Tsuda A, Tanaka Y, Wardle J. Depressive symptoms, socio-economic background, sense of control, and cultural factors in university students from 23 countries. *Int J Behav Med* 2007; 14: 97–107.
- Suija K, Aluoja A, Kalda R, Maaros HI. Factors associated with recurrent depression: a prospective study in family practice. *Fam Pract* 2011; 28: 22–28.
- Suija K, Kalda R, Maaros HI. Patients with depressive disorder, their co-morbidity, visiting rate and disability in relation to self-evaluation of physical and mental health: a cross-sectional study in family practice. *BMC Fam Pract* 2009; 10: 38. doi: 10.1186/1471-2296-10-38.
- Suija K, Rajala U, Jokelainen J, Liukkonen T, Härkönen P, Keinänen-Kiukaanniemi S, Timonen M. Validation of the Whooley questions and the Beck Depression Inventory in older adults. *Scand J Prim Health Care* 2012; 30: 259–264.
- Svensson E, Nygård JF, Sørensen T, Sandanger I. Changes in formal help seeking for psychological distress: the OsLof study. *Nord J Psychiatry* 2009; 63: 260–266.
- Tedstone Doherty D, Kartalova-O'Doherty Y. Gender and self-reported mental health problems: predictors of help seeking from a general practitioner. *Br J Health Psychol* 2010; 15: 213–228.
- ten Have M, de Graaf R, Ormel J, Vilagut G, Kovess V, Alonso J; ESEMED/MHEDEA 2000 Investigators. Are attitudes towards mental health help-seeking associated with service use? Results from the European Study of Epidemiology of Mental Disorders. *Soc Psychiatry Psychiatr Epidemiol* 2010; 45: 153–163.
- ten Have M, Meertens V, Scheepers P, te Grotenhuis M, Beekman A, Vollebergh W. Demand for mental health care and changes in service use patterns in the Netherlands, 1979 to 1995. *Psychiatr Serv* 2005; 56: 1409–1415.
- ten Have, Vollebergh W, Bijl R, Ormel J. Combined effect of mental disorder and low social support on care service use for mental health problems in the Dutch general population. *Psychol Med* 2002; 32: 311–323.
- Tervisestatistika ja uuringute andmebaas*. Tervise Arengu Instituut (TAI) [Internet] 2013 [cited December 2013]. Available from: <http://pxweb.tai.ee/esf/pxweb2008/dialog/statfile2.asp>.

- Tijhuis MA, Peters L, Foets M. An orientation toward help-seeking for emotional problems. *Soc Sci Med* 1990; 31: 989–995.
- Tintle N, Bacon B, Kostyuchenko S, Gutkovich Z, Bromet EJ. Depression and its correlates in older adults in Ukraine. *Int J Geriatr Psychiatry* 2011; 26: 1292–1299.
- Trude S, Stoddard JJ. Referral gridlock: primary care physicians and mental health services. *Journal of General Internal Medicine* 2003; 18: 442–449.
- Tylee A. Depression in Europe: experience from the DEPRES II survey. Depression Research in European Society. *Eur Neuropsychopharmacol* 2000; 10 Suppl 4: S445–448.
- Uebelacker LA, Wang PS, Berglund P, Kessler, RC. Clinical differences among patients treated for mental health problems in general medical and specialty mental health settings in the National Comorbidity Survey Replication. *Gen Hosp Psychiatry* 2006; 28: 387–395.
- van Beljouw I, Verhaak P, Prins M, Cuijpers P, Penninx B, Bensing J. Reasons and determinants for not receiving treatment for common mental disorders. *Psychiatr Serv* 2010; 61: 250–257.
- Vasiliadis HM, Lesage A, Adair C, Boyer R. Service use for mental health reasons: cross-provincial differences in rates, determinants, and equity of access. *Can J Psychiatry* 2005; 50: 614–619.
- Vuorilehto MS, Melartin TK, Isometsä ET. Course and outcome of depressive disorders in primary care: a prospective 18-month study. *Psychol Med* 2009; 39: 1697–1707.
- Wade TD, Kendler KS. The relationship between social support and major depression: cross-sectional, longitudinal, and genetic perspectives. *J Nerv Ment Dis* 2000; 188: 251–258.
- Wallerblad A, Möller J, Forsell Y. Care-Seeking Pattern among Persons with Depression and Anxiety: A Population-Based Study in Sweden. *Int J Family Med* 2012; 895425. doi: 10.1155/2012/895425.
- Wang J, Patten SB, Williams JV, Currie S, Beck CA, Maxwell CJ, El-Guebaly N. Help-seeking behaviours of individuals with mood disorders. *Can J Psychiatry* 2005; 50: 652–659.
- Wang J, Schmitz N, Dewa C, Stansfeld S. Changes in perceived job strain and the risk of major depression: results from a population-based longitudinal study. *Am J Epidemiol* 2009; 169: 1085–1091.
- Wang JL. Rural-urban differences in the prevalence of major depression and associated impairment. *Soc Psychiatry Psychiatr Epidemiol* 2004; 39: 19–25.
- Wang JL, Schmitz N, Dewa CS. Socioeconomic status and the risk of major depression: the Canadian National Population Health Survey. *J Epidemiol Community Health* 2010; 64: 447–452.
- Wang PS, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, Borges G, Bromet EJ, Bruffaerts R, de Girolamo G, de Graaf R, Gureje O, Haro JM, Karam EG, Kessler RC, Kovess V, Lane MC, Lee S, Levinson D, Ono Y, Petukhova M, Posada-Villa J, Seedat S, Wells JE. Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO world mental health surveys. *Lancet* 2007; 370: 841–850.
- Wang PS, Berglund P, Kessler RC. Recent care of common mental disorders in the United States: prevalence and conformance with evidence-based recommendations. *J Gen Intern Med* 2000; 15: 284–292.
- Wang PS, Lane M, Olfson M, Pincus HA, Wells KB, Kessler RC. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005; 62: 629–640.

- Wardle J, Steptoe A, Gulis G, Sartory G, Sêk H, Todorova I, Vögele C, Ziarko M. Depression, perceived control, and life satisfaction in university students from Central-Eastern and Western Europe. *Int J Behav Med* 2004; 11: 27–36.
- Wetherell JL, Kaplan RM, Kallenberg G, Dresselhaus TR, Sieber WJ, Lang AJ. Mental health treatment preferences of older and younger primary care patients. *Int J Psychiatry Med* 2004; 34: 219–233.
- Wittchen HU, Carter RM, Pfister H, Montgomery SA, Kessler RC. Disabilities and quality of life in pure and comorbid generalized anxiety disorder and major depression in a national survey. *Int Clin Psychopharmacol* 2000; 15: 319–328.
- Wittchen HU, Höfler M, Meister W. Prevalence and recognition of depressive syndromes in German primary care settings: poorly recognized and treated?. *Int Clin Psychopharmacol* 2001; 16: 121–135.
- World Health Organization International Consortium in Psychiatric Epidemiology. Cross-national comparisons of the prevalences and correlates of mental disorders. *Bull World Health Organ* 2000; 78: 413–426.
- Wu AM, Tang CS, Kwok TC. Self-efficacy, health locus of control, and psychological distress in elderly Chinese women with chronic illnesses. *Aging Ment Health* 2004; 8: 21–28.
- Yang Y. How does functional disability affect depressive symptoms in late life? The role of perceived social support and psychological resources. *J Health Soc Behav* 2006; 47: 355–372.
- Yates WR, Mitchell J, Rush AJ, Trivedi MH, Wisniewski SR, Warden D, Hauger RB, Fava M, Gaynes BN, Husain MM, Bryan C. Clinical features of depressed outpatients with and without co-occurring general medical conditions in STAR*D. *Gen Hosp Psychiatry* 2004; 26: 421–429.
- Young AS, Klap R, Sherbourne CD, Wells KB. The quality of care for depressive and anxiety disorders in the United States. *Arch Gen Psychiatry* 2001; 58: 55–61.
- Zhang B, Li J. Gender and marital status differences in depressive symptoms among elderly adults: the roles of family support and friend support. *Aging Ment Health* 2011; 15: 844–854.
- Õöpik P, Aluoja A, Kalda R, Maaros HI. Depressiooni ravimine esmatasandil. *Eesti Arst* 2005; 84: 481–487.
- Õöpik P, Aluoja A, Kalda R, Maaros HI. Screening for depression in primary care. *Fam Pract* 2006; 23: 693–698.

SUMMARY IN ESTONIAN

Depressioon Eestis: levimus, seotud tegurid ja tervishoiuteenuste kasutamine

Psüühikahäired on üks probleemsemaid haiguste grupe nii seoses kõrge levimuse, kroonilise kulu, kui ka sageli kaasneva olulise puudega. Halva prognoosi üheks põhjuseks on vähene abi otsimine – ainult ¼ vaimse tervise probleemidega inimestest otsib abi. Vähene abi otsimine emotsionaalsete probleemide korral on seotud nii vähese teadlikkusega haiguste tunnustest, negatiivsete hoiakutega abi tõhususe suhtes kui stigmaga. Tavaline põhjus, miks abi ei otsita, on soov oma probleemidega ise hakkama saada. Raviteenuste kättesaadavuse ja korralduse kõrval võib vähene abi otsimine olla seotud ka sotsiaalse ebarõrdsuse ja sotsiaalse toetuse iseärasustega. Abi otsimist suurendavad kõige enam haiguse raskus, kaasnevad haigused ja psüühikahäirest tingitud funktsioonivõime alanemine.

Depressioon on üks olulisemaid vaimse tervise probleeme, millel on märkimisväärne mõju elukvaliteedile. Depressiooniepisoodi defineeritakse kui kahe või enama nädala pikkust perioodi, mille vältel esinevad vähemalt viis sümptomit suurema osa päevast peaaegu igal päeval, sh. kas alanenud meeleolu või huvi kaotamine peaaegu kõigi tegevuste suhtes, kaalu/isu häired, häiritud uni, psühhomotoorne agiteeritus/pidurdatus, väsimus, väärtusetusetunne, alanenud keskendumis/otsustamisvõime ja suitsiidmõtted. Depressioonile on omane krooniline kulg ja mitmed korduvad episoodid. Paranemise tõenäosus väheneb ajaga ning kroonilise kuluga depressiooni iseloomustab kõrgem raskusaste ning kehaliste haiguste kaasnemine. Tõsised sümptomid ja krooniline kulg põhjustavad olulist sotsiaalset ja kehalist düsfunktsiooni. Depressiooniga kaasnev elukvaliteedi halvenemine võib olla tõsisem kui levinud krooniliste kehaliste haiguste puhul.

Depressiooni levimus ja depressiooniga seonduvad tegurid on jätkuvalt oluliseks uurimisteemaks. Selles, et depressiooni esineb enam naistel, vallalistel või partnerita jäänud inimestel või madala sotsiaalse toetuse korral, ollakse valdavalt üksmeelsed. Sotsiaalse toetuse juures ei ole üheselt kindel, kas depressiooni puhul on määrav sotsiaalse võrgustiku suurus, saadud toe kvaliteet või mõlemad. Sotsiaalmajandusliku staatuse, hariduse, elukoha, vanuse ja depressiooni seoste osas on vastuolulisi seisukohti. Lisaks olemasolevatele teadmistele peetakse vajalikuks saada enam andmeid Ida-Euroopa kohta.

Depressiooni ja krooniliste somaatiliste haiguste retsiprookset seost kinnitavad paljud uuringud. Mõlemad probleemid suurendavad vastastikku ka funktsioonihäire väljakujunemist ning tervishoiuteenustega seotud kulutusi. See, kuidas inimene ise oma terviseseisundit hindab, on depressiooniga oluliselt seotud. Alkohool on üks teguritest, mis on depressiooniga samuti retsiprookselt seotud. Eelkõige on leitud seos depressiooni ja suurtes kogustes sööstudena alkoholi kasutamise vahel.

Sotsiaalmajandusliku staatuse ja haigestumuse seosed on Euroopa riikides oluliselt erinevad. Nii on võimalikud ka riikidevahelised erinevused selles, kuidas depressioon seostub sotsiaalmajanduslike sh. sotsiaalset toetust kirjeldavate teguritega. Arvestades riikidevahelisi erinevusi haigestumuses, võivad terviseseisundi indikaatorid depressiooni puhul olla olulisemaks riskifaktoriks kui sotsiaalmajanduslikud tegurid.

Vaatamata depressiooni rasketele tagajärgedele ei saa suur osa depressiivseid patsiente ravi või see on ebapiisav. Sarnaselt teiste vaimse tervise probleemidega ei märka depressiivsed inimesed oma probleemi, ei pea professionaalset abi vajalikuks või eelistavad oma probleeme ise lahendada. Viimasel juhul on oluline ka sotsiaalse võrgustiku ja selle kaudu saadava toetuse osatähtsus, mis erinevatel andmetel võib abi otsimist nii suurendada kui vähendada. Depressiivse isiku suhtumine sellesse, kas ja kuidas ta suudab oma elus toimuvat kontrollida või kontrollivad seda pigem välised jõud, omab abi otsimise juures suure tõenäosusega oma osa. Üheks võimalikuks kontrolli iseloomustavaks teguriks on väline või seesmine kontrollkese. Kontrollkese näitab kui palju inimene usub, et temaga toimuvat kontrollib tema ise või mingid välised asjaolud.

Abi otsimise juures peetakse üheks olulisemaks teguriks depressiooni raskust koos kaasnevate haiguste ja puudega, mitte niivõrd sotsiaalmajanduslikke tegureid. Depressiooni raskus näib mõjutavat ka seda, kelle käest abi otsitakse ning see võib omakorda mõjutada ravi kvaliteeti.

Tervishoiukorraldusega seotud probleemid ei pruugi olla kõige olulisemaks vähese abi otsimise põhjuseks. Küll aga on selleks depressiooni ebapiisav diagnoosimine, mille tõttu on jätkuvalt oluline saada täiendavaid teadmisi teguritest, mis seostuvad depressiooni ja selle suhtes abi otsimisega. Põhjuseks, miks seda teha, on ka tõsiasi, et ebapiisava depressiooni raviga seostatakse abi ebaefektiivset kasutamist ja tervishoiukulude suurenemist.

Kokkuvõttes võib öelda, et depressiooni levimuse, abi otsimise ja nendega seotud tegurite kohta on vajalikud uuringud erineva sotsiaalmajandusliku ja terviseseisundi olukorraga riikidest. Selle tõttu pidasime vajalikuks uurida depressiooni levimust ja abi otsimist emotsionaalsete probleemide ja depressiooni korral ning nendega seotud tegureid Eesti elanikkonnas.

Meie peamisteks hüpoteesideks olid

I sotsiaalmajanduslik staatus ja terviseseisund on depressiooniga oluliselt seotud; nii sotsiaalse toetuse struktuursed kui funktsionaalsed tegurid on depressiooniga seotud; emotsionaalselt üksildastel ja välise kontrollkeskmega isikutel esineb enam depressiooni;

II abi otsimine emotsionaalsete probleemide ja depressiooni korral on madal nii Eesti elanikkonna seas kui depressiooniga isikute seas; sotsiaalmajanduslikud tegurid ei ole depressiivsetel isikutel abi otsimisega seotud; depressiooni raskus, sotsiaalne toetus ja väline kontrollkese suurendavad abi otsimist depressiooni korral.

Uurimistöö eesmärgid

1. määrata depressiooni levimus Eestis
2. leida depressiooni seosed sotsiaalmajanduslike tegurite, terviseseisundi ning sotsiaalse toetuse indikaatoritega
3. uurida 12-kuu jooksul emotsionaalsete probleemide korral abi otsimist, ning selle seoseid sotsiaalmajanduslike tegurite ning terviseseisundi indikaatoritega **Eesti elanike seas**
4. uurida 12-kuu jooksul emotsionaalsete probleemide korral abi otsimise seoseid sotsiaalmajanduslike tegurite, terviseseisundi indikaatorite ja sotsiaalse toetusega **depressiooniga isikute seas**

Materjal ja meetodid

Antud uuring oli osa Eesti Terviseuuringust 2006, mis on omakorda osa Euroopa Terviseuuringute süsteemist. Tegemist oli üleriigilise küsitlusuuringuga, kus kasutatakse nii ristlambilõikelist retrospektiivset kui sündmusloolist meetodikat.

Terviseuuringu üldkogumi moodustasid kõik 15–84-aastased (seisuga 01.01.2006) Eesti alalised elanikud. Loendina kasutati AS Andmevara rahvastiku andmebaasi. Valimi võtmisel kasutati kihistatud süstemaatilist valikut. Üldkogum jaotati elukoha, soo ja vanuse järgi mittekattuvateks kihtideks. Valimi mahu määramisel kihtides arvestati üldkogumi suurust ning vastamistõenäosuse piirkondlikke ja vanuselisi erinevusi. Valimi esialgne maht oli 15 000 isikut. Enne välitööde algust valiti neist lihtsa juhuvalikuga 11 023 isikut, mis jäigi lõplikuks valimi mahuks. Andmesisestuse lõppedes registreeriti andmebaasi 6434 isiku kirjed.

Terviseuuringu täpsustatud vastamismäär oli 60,2%. Vastamismäär oli madalam nooremates vanusegruppides, meeste seas ja suuremate linnadega piirkondades.

Käesolev uuring haaras täiskasvanud vanuses 18–84 aastat ning valimi suurus oli 6105 isikut (2928 meest ja 3177 naist). Depressiooniga isikute valimi suurus oli 343 (118 meest ja 225 naist).

Andmed sotsiaalmajanduslike tegurite, terviseseisundi, alkoholi kasutamise, abi otsimise, depressiooni ravi ja sotsiaalse toetuse kohta saadi Terviseuuringu struktureeritud intervjuudest. Küsimustik oli eesti- ja venekeelne ning koosnes 22 erinevast osast. Käesoleva depressiooniepisoodi määramiseks kasutati MINI rahvusvahelise neuropsühhiaatrilise intervjuu vastavat moodulit, mis oli samuti üks osa Terviseuuringu küsimustikust. Depressiivsete sümptomite summat kasutati depressiooni raskusastme määramiseks.

Sotsiaalmajanduslikest teguritest kasutati andmeid soo, vanuse, rahvuse, elukoha, hariduse, abielulisuse, tööstatuse ja sissetuleku kohta. Sissetuleku indikaatoriks oli keskmine netosissetulek kuus leibkonnaliikme kohta Eesti kroonides. Vastanud jagati sissetuleku alusel kvartiilidesse.

Terviseteguritest hinnati enesemääratletud terviseseisundit ja pikaajalise/kroonilise terviseprobleemi olemasolu. Probleemse alkoholikasutamise indikaatorina kasutati korruga suures koguses joomise sagedust viimasel 12 kuul.

Abi otsimist iseloomustasid abi otsimine emotsionaalsete probleemide tõttu viimase 12 kuu jooksul, abiandjate variandid ja nende poole pöördumise sagedus viimase 12 kuu jooksul ning viimase 12 kuu jooksul kasutatud abi meetodid. Lisaks uuriti perearsti poole pöördumist viimase 4 nädala ja viimase 12 kuu jooksul, kiirabi kutsumist, traumapunkti või erakorralise meditsiini osakonna külastamist või haiglaravil viibimist viimase 12 kuu jooksul ning ravikindlustuse olemasolu.

Ravilõhe näitab nende isikute osakaalu, kes vajasid ravi, kuid ei saanud mingit ravi. Ravi mitte saanute hulka arvestati need, kes vastasid, et ei saanud mingit ravi ja need kes ei otsinud abi.

Sotsiaalse toetuse struktuuriliste indikaatoritena kasutati leibkonna suurust, kooselu, väljaspool kodu kontaktide sagedust vanematega, lastega ja sõpradega ja kuulumist organisatsioonidesse. Emotsionaalse ja sotsiaalse üksinduse mõõtmiseks kasutati *The De Jong Gierveld Short Scales for Emotional and Social Loneliness* skaalat. Lähisuhte kvaliteedi indikaatorina hinnati emotsionaalset rahulolu paarisuhtega. Viimast kolme tunnust käsitleti sotsiaalse toetuse funktsionaalsete indikaatoritena.

Kontrollkeskme mõõtmiseks kasutati *The Rotter Internal-External Locus of Control Scale (I-E Scale)* skaalat.

Depressiooni ja abi otsimise seoste analüüsimiseks kasutati esmalt logistilist regressioonanalüüsi iga tunnusega eraldi. Nende tunnustega, mis jäid esimeses mudelis oluliseks, viidi läbi mitmene regressioonanalüüs.

Tervishoiuteenuste kasutamise analüüsimiseks viidi läbi regressioonanalüüs depressiooni ja konkreetse tervishoiuteenuse vahel ning teises mudelis sama analüüs kohandatuna kroonilise kehalise häirega.

Sotsiaalse toetuse indikaatorite ja abi otsimise seoste analüüsimisel kasutati lisaks binaarsele regressioonanalüüsile emotsionaalse üksilduse ja muude sotsiaalse toetuse indikaatorite paaride interaktsioonide ja depressiooni korral abi otsimise regressioonanalüüsi. Kõik regressioonanalüüsid kohandati soo ja vanuse suhtes.

Tulemused ja arutelu

1. Käesolevas töös leiti, et depressiooni levimus (5,6%) Eesti elanikkonna seas on samas suurusjärgus Põhja-Ameerikas ja Euroopas tehtud levimusuuringutega, olles keskmisest vaid mõnevõrra kõrgem.
2. a) Depressiooni esines enam naistel, lahutatud või leseks jäänud isikutel, madalama sissetulekuga, madalama haridusega, linnas elavatel isikutel, mitte-eestlastel, üle 40 aastastel ja halvema terviseseisundiga isikutel.
b) Madal sissetulek ja halb terviseseisund olid sotsiaalmajanduslikest ja terviseseisundi indikaatoritest kõige olulisemad depressiooniga seotud tegurid. Kõigil kolme madalamasse sissetulekukvartiili kuuluvatel isikutel oli võrdne depressiooni risk. Ühe selgitusena võib siin kaaluda Eesti suhteliselt kõrget sotsiaalset ebavõrdsust koos suhtelise vaesusega. Siinjuures on oluline märkida, et kaasuva kroonilise somaatilise haiguse esinemine oli depressiivsete isikute seas väga kõrge.

- c) Erinevalt paljudest varasematest uurimustest leidsime, et depressiooni esines enam vanemates eagruppides. Selline tulemus on omane pigem vähemarenenud riikidele. Võttes arvesse sissetuleku, tervise seisundi ja sotsiaaldemograafilised tegurid, muutus depressiooni ja vanuse seos vastupidiseks. Meie tulemus viitab suure tõenäosusega tervise seisundi ja sissetulekuga seotud tegurite olulisusele just vanemate eagruppide kõrgema depressiooniriski puhul.
- d) Nii sotsiaalse toetuse struktuurilised kui funktsionaalsed tegurid olid depressiooniga seotud. Meie tulemused viitavad sellele, et suurem sotsiaalne toetus ja sagedasemad kontaktid sõprade ja vanematega võivad omada kaitsvat efekti depressiooni vastu. Võimalik, et selle üheks selgituseks on mainitud teguritega kaasnev suurem sotsiaalne integreeritus ning kõrgem emotsionaalne toetus. Sotsiaalse toetuse indikaatorite seas paistis välja emotsionaalse üksinduse oluline seos depressiooniga, mis kinnitab varasemaid oletusi, et depressiooni puhul on oluliseks riskiteguriks see, kuidas inimene tajub sotsiaalse toetuse kättesaadavust. Sellega seostub ka meie tulemus, mis kinnitab kontrollkeskme seotust depressiooniga. Depressiooni on vähem, kui inimene tunneb, et ta kontrollib oma elu ja emotsionaalne tugi on kättesaadav.
3. Emotsionaalsete probleemide tõttu abiotsimise sagedus Eesti elanikkonna seas 12 kuu jooksul oli madal (4.8%) ning meie tulemus ei erine oluliselt teistest uuringutest.
- Abi otsisid enam naised, lahutatud ja leseks jäänud inimesed, mitte-eestlased, madalama hariduse ja sissetulekuga inimesed, halvema tervise seisundi või eelneva depressiooniepisoodiga isikud, abi otsimine suurenes vanuse tõustes.
- Kõige olulisemad abi otsimist ennustavad tegurid emotsionaalsete probleemide korral Eesti elanikkonnas olid käesolev ja eelnev depressiooniepisood, oluline tervisehäire, puue ja vanus.
4. a) Depressiooniga isikute puhul sõltus abi otsimine enam tervise seisundi teguritest, mitte niivõrd sotsiaalmajanduslikest faktoritest, kuid kõige olulisem tegur oli depressiooni raskus. Sotsiaalmajanduslikke ja tervise seisundi tegureid ühekaupa analüüsid sarnanes depressiooni korral abi otsimine abi otsimisega üldpopulatsioonis.
- Meie tulemused ei kinnita üheselt sotsiaalse toetuse ja abi otsimise seost depressiooni korral. Saame öelda, et depressiooni korral sõltub abi otsimine kontrollkeskmest, olles sagedasem välise kontrollkeskme puhul, ning interaktsioonidest emotsionaalse üksinduse, kontrollkeskme ja vanematega kontaktide sageduse vahel.
- b) Ainult 1/3 depressiooniga isikuid otsis abi, mis on madalam kui Euroopas keskmiselt, kuid üldiselt samas suurusjärgus. Ligikaudu ¾ neist, kes oleksid pidanud saama depressiooni ravi, ei saanud seda. Samas oli medikamentoosse ravi osakaal abi saanute hulgas 90%, mis on suhteliselt kõrge.

Meil on alust arvata, et vähese abi otsimise ja ravi saamise põhjuseks on eelkõige aladiagnostika. 1/4 depressiivsetest inimestest oli eelneva 12 kuu jooksul otsinud abi oma perearsti juurest seoses emotsionaalsete probleemidega. Samas olid pea kaks korda enam depressiivsetest inimest külastanud oma perearsti, mis iganes põhjusel eelneva 4 nädala jooksul. Isegi kui arvestada erinevaid ajavahemikke, võib väita, et umbes pooled depressiivsetest inimestest ei olnud teadlikud oma vaimse tervise probleemist või ei pidanud vajalikuks selle osas abi otsida.

Kokkuvõttes jäi suure osa depressiooniga isikute meeleoluhäire tähelepanuta. Selle põhjuseks on suure tõenäosusega nii see, et isikud ise ei otsi depressiooni suhtes abi, abi andjatel on aega või oskusi diagnoosimiseks vähe kui ka kaasuv somaatiline häire, mis võib diagnostikat raskendada.

Samas kasutasid depressiooniga isikud tervishoiuteenuseid (eelkõige erakorralise meditsiini) kuni 3 korda enam sõltumata kaasnevast kroonilisest somaatilisest häirest. Meil on alust arvata, et depressiooni aladiagnostika ja eba piisav ravi viivad tervishoiuteenuste mitte-sihipärase kasutamiseni ja põhjendamatute kulutusteni.

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PUBLICATIONS

CURRICULUM VITAE

Name: Anne Kleinberg
Date of birth: 31.08.1971
Citizenship: Estonia
Current position: Tallinn Children Hospital, Tervise 28, Tallinn
Address: Department of Psychiatry, University of Tartu, Raja 31,
Tartu, Estonia 50417
Phone: +372 513 6217
E-mail: anne.kleinberg@lastehaigla.ee

Education:

1978–1989 Tallinn Secondary School No 3
1989–1995 Medical Faculty, University of Tartu
1995–1997 University of Tartu, Medical Faculty, internship
1997–2001 University of Tartu, Medical Faculty, psychiatry residence
2007–2013 University of Tartu, Medical Faculty, Psychiatry Clinic,
doctoral studies

Professional career:

2001–2004 Tallinn Children Hospital, psychiatrist
2004–2012 Tallinn Children Hospital, head of Psychiatric Service
2012– Tallinn Children Hospital, head of Psychiatry Clinic

Research and development work:

Main fields of research: prevalence of depression, associated factors and help-seeking in case of depression.

List of publications:

1. **Kleinberg, A**, Aluoja, A, Vasar, V. Point prevalence of major depression in Estonia. Results from the 2006 Estonian Health Survey. *European Psychiatry* 2010; 25 (8), 485–90.
2. **Kleinberg, A**, Aluoja, A, Vasar, V. Help-seeking for emotional problems in major depression. Findings of the 2006 Estonian Health Survey. *Community Mental Health Journal*. 2012 Feb 4.
3. **Kleinberg, A.**, Aluoja, A., Vasar, V. Social support in depression: structural and functional factors, perceived control, and help-seeking. *Epidemiology and Psychiatric Sciences* 2013; 24: 1–9.
4. **Kleinberg A**, Aluoja A, Vasar V. Depressiooni ja ärevuse esinemine Eesti inimestel: depressiivse häire hetkelevimus, depressiivsuse ja ärevuse levimuse muutus kümne aasta jooksul. *Eesti Arst* 2008; 88 (Lisa2): 80–86.
5. **Kleinberg A**, Jaanson P, Lehtmets A, Aluoja A, Vasar V, Suija K, Ööpik P. Depressiooni ravijuhend perearstidele. *Eesti Arst* 2011; 90: 431–446.

Teaching work:

Information regarding the teaching work carried out at universities

2008– Tallinn University, lecturer of department of social sciences course “Child psychopathology”

Supervision: regular supervision of psychiatry and pediatry trainees in Tallinn Children Hospital.

Professional development:

1995 The Nordic School of Public Health course “Policy Analysis for Health Care Administrators”

1997 Estonian Association of Cognitive Behavioural Therapy, basic course of cognitive behavioural therapy

1997–2004 Scottish Institute of Human Relations, child and adolescent psychoanalytical psychotherapy training

1998–2001 Estonian Association of Family Therapy, family therapy training

Public and social activities:

2006–2008 Scientific Board of the Estonian Health Survey 2006, member

2013 Estonian Health Survey 2014, expert

2004–2013 Estonian Psychiatric Association, Secretary General

2013– Estonian Psychiatric Association, Vice-President

2007– Child and Adolescent Psychiatry Section of the Estonian Psychiatric Association, President

2004– UEMS Section & Board of Psychiatry, delegate

2012– Board of the Medical Faculty of University of the Tartu, member

2001– Estonian Association of Family Therapy, member

2004– Estonian Association of Child and Adolescent Psychotherapy, member

ELULOOKIRJELDUS

Nimi: Anne Kleinberg
Sünniaeg: 31.08.1971
Kodakondsus: Eesti
Praegune töökoht: SA Tallinna Lastehaigla, Tervise 28, Tallinn
Aadress: TÜ psühhiaatrikliinik, Raja 31, Tartu 50417
Telefon: +372 513 6217
E-post: anne.kleinberg@lastehaigla.ee

Haridus:

1978–1989 Tallinna 3. keskkool
1989–1995 Tartu Ülikool, arstiteaduskond
1995–1997 Tartu Ülikool, arstiteaduskond, üldinternatuur
1997–2001 Tartu Ülikool, arstiteaduskond, psühhiaatria residentuur
2007–2013 Tartu Ülikool, arstiteaduskond, psühhiaatrikliinik, doktoriõpe

Teenistuskäik:

2001–2004 Tallinna Lastehaigla, psühhiaater
2004–2012 Tallinna Lastehaigla, psühhiaatriateenistuse juhataja
2012– Tallinna Lastehaigla, psühhiaatrikliiniku juhataja

Teaduslik ja arendustegevus:

Peamised uurimisvaldkonnad:

Depressiooni levimus, seotud tegurid ja abi kasutamine depressiooni korral.

Publikatsioonide loetelu:

Teaduslikud artiklid rahvusvahelise levikuga väljaannetes:

1. **Kleinberg, A**, Aluoja, A, Vasar, V. Point prevalence of major depression in Estonia. Results from the 2006 Estonian Health Survey. *European Psychiatry* 2010; 25 (8), 485–90.
2. **Kleinberg, A**, Aluoja, A, Vasar, V. Help-seeking for emotional problems in major depression. Findings of the 2006 Estonian Health Survey. *Community Mental Health Journal*. 2012 Feb 4.
3. **Kleinberg, A.**, Aluoja, A., Vasar, V. Social support in depression: structural and functional factors, perceived control, and help-seeking. *Epidemiology and Psychiatric Sciences* 2013; 24: 1–9.

Muud teaduslikud artiklid:

4. **Kleinberg A**, Aluoja A, Vasar V. Depressiooni ja ärevuse esinemine Eesti inimestel: depressiivse häire hetkelevimus, depressiivsuse ja ärevuse levimuse muutus kümne aasta jooksul. *Eesti Arst* 2008; 88 (Lisa 2): 80–86.
5. **Kleinberg A**, Jaanson P, Lehtmets A, Aluoja A, Vasar V, Suija K, Ööpik P. Depressiooni ravijuhend perearstidele. *Eesti Arst* 2011; 90 (9): 431–446.

Muu teaduslik organisatsiooniline ja erialane tegevus:

- 2006–2008 Eesti Terviseuuring 2006 teadusnõukogu liige
2013 Terviseuuring 2014 ekspert
2004–2013 Eesti Psühhiaatrite Selts, sekretär
2013– Eesti Psühhiaatrite Selts, asepresident
2007– Eesti Psühhiaatrite Selts lastepsühhiaatria sektsioon, president
2004– UEMS Section & Board of Psychiatry, delegaat
2012– Tartu Ülikooli arstiteaduskonna nõukogu, liige
2004– Eesti Psühhoanalüütilise Lasteteraapia Seltsi liige,
2001– Eesti Pereteraapia Ühingu liige

Õppetöö:

Andmed kõrgkoolis tehtud auditoorse õppetöö kohta: alates 2008 aasta Tallinna Ülikool sotsiaaltöö osakond ainekursus “Lapse psühhopatoloogia”
Juhendamine: regulaarne psühhiaatria ja pediaatria eriala residentide juhendamine Tallinna Lastehaiglas.

Erialane enesetäiendus:

- 1995 The Nordic School of Public Health kursus “Policy Analysis for Health Care Administrators”
1997 Eesti Kognitiivse ja Käitumisteraapia Assotsiatsioon, kognitiiv-käitumusliku psühhoterapia algkursus
1997–2004 Scottish Institute of Human Relations, laste ja noorukite psühhoanalüütilise psühhoterapeudi koolitus
1998–2001 Eesti Pereteraapia Ühing, pereterapeudi koolitus

DISSERTATIONES MEDICINAE UNIVERSITATIS TARTUENSIS

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86. **Jaan Soplemann.** Peptic ulcer haemorrhage in Estonia: epidemiology, prognostic factors, treatment and outcome. Tartu, 2003.
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