

**PERCEIVED GENERAL AND MENTAL
HEALTH, THEIR SOCIO-ECONOMIC
CORRELATES AND RELATIONSHIPS
WITH PHYSICAL ACTIVITY
IN FERTILITY-AGED WOMEN IN ESTONIA**

MERIKE KULL



TARTU UNIVERSITY
PRESS

Department of Pedagogy, University of Tartu, Tartu, Estonia

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Supervisor: Atko-Meeme Viru, Professor Emeritus
University of Tartu, Estonia

Opponents: Ilkka Vuori, MD, Professor
Urho Kaleva Kekkonen Institute for Health Promotion
Research, Tampere, Finland
Professor Toivo Jürimäe, Institute of Sport Pedagogy,
University of Tartu, Estonia

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LIST OF ORIGINAL PUBLICATIONS

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- III Kull M. The relationships between physical activity, health status and psychological well-being of fertility-aged women. *Scandinavian Journal of Medicine and Science in Sport* 2002; 12: 241–247.

INTRODUCTION

The past fifteen years of political, social, and economic changes, have made a dramatic impact on women's lives in the Baltic States. Estonia, like other countries undergoing transition, experienced sweeping changes in the distribution of income, which has led to the growth of the population group who live in poverty or are at risk of poverty (Kutsar and Trumm, 1999). Research all over the world suggests that namely socio-economic inequality and poverty are related to poor health and depressive symptoms in women (Aro et al., 2001; Balabanova and McKee, 2002; Mazure et al., 2002; Wroblewska, 2002; Belle, 2003). Reported poor health is worst for individuals at the bottom of the social hierarchy (Cooper, 2002; Leinsalu, 2002; Mazure et al., 2002; McDonough et al., 2002; Belle, 2003). Changes in mortality that occurred in the 1990s in Central and Eastern European countries showed that major economic and social changes have affected the health status of the population (Bobak et al., 2000). Life expectancy of Estonian women at birth is 6–8 years shorter than in other European countries — in 1995 the average life expectancy of Estonian women was 74.3 years (Pölluste, 1998) while that of women in many European countries was 80.1 years or even higher: 81.9 years in France, 81.2 in Spain, and 80.2 in Finland (European Commission, 1997). The links between the socio-economic status and health indicators in women in former communist countries have not been well described as yet, but published reports suggest relatively large economic and educational gradients in health and morbidity (Carlson, 1998; Wroblewska, 2002). Similarly, suicide is a sensitive indicator of the mental well-being of a society, and studies of the 1990s show that the highest suicide rates in the world for both men and women are found in a group of countries that share similar genetic, historical, and sociocultural characteristics: Estonia, Latvia, and Lithuania (Bertolote, 2003). One might presume that wider social variability in Estonia also affects the distribution of mental disorders in the population. Previous epidemiological research worldwide has shown that women experience psychic and psychosomatic disturbances more often than men do (Verbrugge, 1989; Lahelma et al., 1993; Lahelma et al., 1999). For example, across many nations and cultures women are about twice as likely as men to develop depression (Kessler et al., 1993; Lehtinen and Joukamaa, 1994; Bebbington, 1996; Lepine et al., 1997; Nolen-Hoeksama, 2001; Mazure et al., 2002; Blehar and Keita, 2003; Aluoja et al., 2004). Consequently, women can be more exposed to mental health risks following societal changes during the transitional period in Estonia. Therefore, it is important to identify the groups at imminent high risk that can be effective in increasing the utility of preventive interventions.

Mental health problems constitute a public health burden worldwide, decreasing the quality of life and adding substantially to health care costs. There is a growing interest among the health promotion professionals in the role that

physical activity could have in preventing the onset of emotional problems and in serving as a treatment modality once such problems have developed (Weyerer, 1992; Dunn et al., 2005). The positive relationship between physical activity and mental health was demonstrated in cross-sectional studies (Stephens, 1988; Weyerer, 1992), in prospective studies (Farmer et al., 1988; Camacho et al., 1991), and in several randomized controlled trials (Labbe et al., 1988; Martinsen et al., 1989). The report of U.S. Surgeon General on mental health included physical activity as an important part of mental hygiene (USDHHS, 1999). In Baltic States, participation in leisure-time physical activity has been reported to be generally low (Pomerleau et al., 2000; Puska et al., 2003) and women show lower rates of participation in physical activity than men (Puska et al., 2003). Therefore, studies of women's physical activity are needed to help define targeted public health strategies.

1. REVIEW OF LITERATURE

1.1. Health

Definitions of health are framed in broad terms. The single common feature in these definitions is that they regard health and illness as opposite poles on the same continuum. Among these definitions, three different categories are found. The first category is based on a natural scientific, objective, or biomedical view. According to definitions of this type, “health is a state in which no disturbances of the functioning of the psycho-physiological apparatus that forms the human being can be demonstrated by natural scientific methods” (Suominen, 1993). The second category emanates from interactions among individuals and is called the sociological definition of health. According to this definition, “health is an undisturbed relation between the individual and her or his social environment” (Parsons, 1952; Suominen, 1993). The third category emphasizes the human being’s subjective experiences and is called the psychological definition of health.

The most well-known definition comes from the World Health Organization (1958) decree where the health was defined as “...a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. Although highly criticized, this definition has guided professionals and politicians since it has conceived. In 1981 the World Health Organization (WHO) stated: “Health is seen as a resource for everyday life, not the objective of living ... Health is a positive concept emphasizing social and personal resources, as well as physical capabilities” (WHO, 1986). This broad definition of health focuses on the physical and emotional quality of people’s lives, rather than on rates of diagnosed illness. The meaning of health is dynamic and changes over time and within different contexts.

1.1.1. Perceived health

The growing body of research on the determinants of health has generated the demand for a universal health outcome measure other than death that would be reliable, valid, and straightforward to administer. The single-item indicator of perceived health has proved to be a reliable multidimensional summary measure of overall health, a useful concept in research, prevention, and clinical medicine (Manderbacka, 1998). The reliability of self-assessment has been found to be as good as or better than such measures as functional ability, chronic diseases, and psychological well-being (Lundberg and Manderbacka, 1996). Relatively high reliability of four-week tests/retests has been reported across various sub-populations (Lundberg and Manderbacka, 1996). Perceived health is highly correlated with more objective measures, such as physicians’ assessments

(LaRue et al., 1979; Ross and Bird, 1994) and number of the physician contacts per year and mortality (Miilunpalo et al., 1997), demonstrating further validity of self-perceived health. Based on findings from longitudinal analyses, it can be concluded that perceived health is predictive of chronic disease incidence (Kaplan et al., 1996; Shadbolt, 1997), functional decline (Idler and Kasl, 1995; Idler et al., 2000) even when more objective health measures are taken into account. Perceived health has also been found to be predictive of mortality (Kaplan et al., 1996; Idler and Benyamini, 1997).

Gender differences in assessing perceived health have shown that compared with men, women consider a broader set of factors when making general ratings of health. Women are more likely to consider psychological factors and the presence of non-life-threatening illnesses (Benyamini et al., 2000).

Perceived health is acknowledged by the WHO as a recommended instrument for monitoring health interview surveys (De Bruin et al., 1996), and it measures health as defined by WHO “a state of well-being, not simply the absence of disease”. As an indicator of the quality of people’s lives, health may be best assessed by the subjective judgement of the individual.

1.1.2. Mental health

Mental health is a state of successful performance of mental function, resulting in productive activities, fulfilling relationships with other people, and the ability to adapt to change and to cope with adversity (USDHHS, 1999). Mental health, as an indivisible part of general health, reflects the equilibrium between the individual and the environment (Lahtinen et al., 1999). Mental health can be seen as the emotional and spiritual resilience, which enables us to enjoy life and to survive pain, disappointment, and sadness. It is a positive sense of well-being and an underlying belief in our own and others’ dignity and worth (HEA, 1997). Mental health is a resource that we need for everyday life, which enables us to manage our lives successfully (Lavikainen et al., 2000). Mental health and well-being are a result of the influence of various predisposing factors (e.g. early childhood experiences), precipitating factors (e.g. stressful life events), social interaction, and individual resources (Lahtinen et al., 1999).

There are two main approaches to mental health — positive and negative. Positive mental health considers mental health as a resource. It is essential both to general well-being and our ability to perceive, to comprehend, and to interpret our surroundings, to adapt to them or to change them if necessary, and to communicate to each other (Lahtinen et al., 1999). Negative mental health is about mental disorders, symptoms, and problems. Mental disorders are defined in the current diagnostic classifications by the existence of symptoms. Mental symptoms and problems also exist without meeting the criteria for clinical disorders.

1.1.2.1. Common mental health disorders

A mental health disorder is any health condition that is characterized by alterations in thinking, mood, or behaviour (or some combination thereof) associated with distress and/or impaired functioning (USDHHS, 1999). The most frequently reported disorders are affective (mood) and anxiety disorders, and women report a higher prevalence of affective and anxiety disorders than men (USDHHS, 1996; Lavikainen et al., 2000). Population studies show that at any point in time at least 15–20% of the population show symptoms of some mental disorder satisfying the criteria of disease classifications (Kessler et al., 1994b; Jenkins et al., 1997; Lavikainen et al., 2000). Almost half the cases correspond to mixed states of anxiety/depression. General anxiety disorder is found in 3–5% of the population, and panic disorders exist in 1–3%. Among phobic disorders specific phobias are very frequent (more than 10% of adults) whilst agoraphobia and social phobia have the prevalence of 2–4% and 4–7%, respectively (Lavikainen et al., 2000). The lifetime occurrence of any mental disorder has been estimated to be as high as 30–50% (Lahtinen et al., 1999).

Depressive symptoms are the most prevalent psychiatric symptoms in the community and are strongly associated with the development of depressive disorder. The prevalence of current depressive symptoms has been estimated to vary from 6% to 20% of the population (Lehtinen and Joukamaa, 1994; Kessler et al., 1997; Lepine et al., 1997; Ayuso-Mateos et al., 2001). In Estonia depressive symptoms have been observed in 11.1% of the population (Aluoja et al., 2004). The lifetime prevalence of depression in the adult population in European countries has been assessed to be as high as 18%, and its lifetime risk is even higher (20–30%) (Lehtinen and Joukamaa, 1994). Depression is particularly devastating for women, with women being at a 2:1 greater risk than men for most types of depression (Kessler et al., 1993; Lehtinen and Joukamaa, 1994; Bebbington, 1996; Lepine et al., 1997; Mazure et al., 2002; Blehar and Keita, 2003; Aluoja et al., 2004).

Depression may occur at any stage during a woman's life, and it occurs across educational, economic, and racial/ethnic groups (Mazure et al., 2002). The heavy public health burden of depression in women results not only from high population prevalence but also from the characteristic of its clinical course — early onset (Kessler et al., 1993), recurrence (Kessler et al., 1994a), chronicity, and comorbidity (Mazure et al., 2002). Since depression has peak onsets in women's childbearing years, the mental health of entire families is significantly affected (Blehar and Keita, 2003). Significant personal costs are associated with depression, including loss of life by suicide, increased morbidity from medical illness, and attendant risk of poor self-care and reduced adherence to medical regimens (Mazure et al., 2002). Major depression, even without concurrent medical illness, impairs social and physical functioning, in some cases more severely than such serious medical conditions as hypertension, diabetes, and arthritis (Wells et al., 1989).

Poor mental health is not a trivial issue. The WHO estimates that one in four people, that are around 450 million people, currently suffer from mental or neurological disorders. Consequently, mental disorders are among the leading causes of ill health and disability worldwide (Murray and Lopez, 1997). It is important for health professionals to consider how to prevent this problem. The report of U.S. Surgeon General on mental health included physical activity as an important part of mental hygiene (USDHHS, 1999). A protective effect of physical activity against the primary and the secondary risk of developing depression and anxiety disorders would have great potential importance for public health (Dishman et al., 2004).

In general, the health studies must take into consideration the differences in health between and within societies. Therefore, it is relevant to advance the understanding of possible health determinants in different regions.

1.2. Health and socio-economic determinants

Many health outcomes, including disability, perceived health status, and the presence or absence of disease and mortality risk, are shaped by a complex process of environmental, social behavioural, psychosocial, and genetic events (Moss, 2002). Lahelma (1999) has identified four main determinants of gender-based differences in health status:

- a) biological determinants, including women's reproductive physiology as well as hormonal and genetic factors;
- b) psychological determinants, such as gender images and identities;
- c) behavioural determinants including the 'holy four' health behaviours (smoking, drinking, eating, and physical activity);
- d) social factors.

This study focuses on two of these aspects — the social determinants (socio-economic status) and behavioural determinants (physical activity). The socio-economic status is indicated by selected variables like education and income, and women's social roles, such as employment, marital and parental status. The finding that health is influenced by one's socio-economic position is well established; reported poor health is most characteristic of individuals at the bottom of the social hierarchy (Cooper, 2002; Leinsalu, 2002; Mazure et al., 2002; McDonough et al., 2002; Belle, 2003). However, the links between social determinants and health indicators in women in former communist countries have not been well described as yet. Published reports suggest relatively large economic and educational gradients in health and morbidity (Carlson, 1998; Wroblewska, 2002; Balabanova and McKee, 2002).

1.2.1. Education

The level of educational qualification may be important in the creation and maintenance of social inequalities in health through shaping cognitive skills and learning that are important for maintaining good health or determining future labour market success and material resources. The educational qualifications are strongly associated with the general health of working-age adults, and unlike class, education differentiates the health of women who were non-employed (Kessler, 1982; Arber, 1997). Important evidence is the poorer health of women with lower education (Leinsalu, 2002; McDonough et al., 2002), higher level of depressive symptoms (Lehtinen and Joukamaa, 1994; Aro et al., 2001), and differences in mortality rates (Mackenbach et al., 1999). Some studies have found that differences in mortality rates between those in higher and lower educational categories actually increased from the 1960s in developed countries due to increased wealth inequality (Pappas et al., 1993).

1.2.2. Income

Estonia has experienced sweeping changes in the distribution of incomes, which has led to the growth of the population group who live in poverty or at risk of poverty. In the mid-nineties 18.1% of the population in Estonia lived below the subsistence poverty line, 18.1% on the verge of subsistence poverty, and 16.6% in the poverty risk group; 47.2% of the population were not at risk of poverty (Kutsar and Trumm, 1999). Similarly, other studies in Central and Eastern European countries have shown that income inequalities have widened considerably (Wroblewska, 2002; Balabanova and McKee, 2002), and some studies have found that economic hardship affects the health of women more than that of men (Balabanova and McKee, 2002; Leinsalu, 2002). Recent research suggests that economic inequality and poverty are one of the most consistent predictors of poor health and depressive symptoms in women (Aro et al., 2001; Balabanova and McKee, 2002; Mazure et al., 2002; Wroblewska, 2002; Belle, 2003).

Women are more likely than men to have income below the poverty line, and depressive symptoms are common among low-income persons, particularly mothers with young children (Mazure et al., 2002). Poor women experience more frequently serious and uncontrollable life events than the general population, typically in the context of ongoing chronic deprivation (Brown et al., 1975). Inadequate housing, burdensome responsibilities, and other chronic conditions are even more stressful than acute crises and events (Brown et al., 1975; Stansfeld et al., 1998). Poor women are often so powerless in dealing with their problem, and repeated coping failures may then lead to the belief that stress factors cannot be overcome, leading women to palliative coping strategies such as ruminative thinking (Mazure et al., 2002) and self-medication with

drugs or alcohol, overeating, sleeping during the day, and repressing thoughts of the problem (Belle, 2003).

1.2.3. Employment

Early interest in the relationship between social roles and health was sparked by the large-scale entry of women into the labour market, which began in the 1960s (Cooper, 2002; McDonough et al., 2002). There were radical changes in actual and expected gender roles (Arber and Khlat, 2002) and most women in developed societies remain in the role of full-time housewife for only a few years when their children are young (Ginn et al., 2001).

Women's employment in Estonia in the 1990s was higher than the European average (Narusk, 2000). Women were widely represented mostly in occupations that are not very prestigious and where wages are below average. In 1997 the employment rate for women aged 30 to 44 was 74.9–84.6%. Estonian women had not adopted part-time work to the degree favoured by women in many other countries and worked full-time (Vöörman, 2000). In western countries where most women work full-time, it has been found that occupational activity has a strong influence on their health (Arber and Lahelma, 1993).

There are two competing hypotheses concerning women's employment and health. First, the 'multiple burden hypothesis' suggests that having paid work and dependent children is likely to lead to health-damaging role strain and stress among women (Gove, 1984). Paid employment for women is conceptualized as an additional role, and the three basic areas of conflict can be distinguished as time, physical and mental burdens, and conflicting gender role expectations (Greenhaus and Beutell, 1985). In contrast, the 'multiple attachment hypothesis' suggests that multiple roles imply multiple attachment to the community, which is likely to enhance an individual's sense of purpose and meaning in life and to promote women's health (Arber, 1997; Waldron et al., 1998). Several studies have shown that employed women report better health than those not in the labour force despite their higher levels of social life and child stress and exposure to job strain. The employed women report the best physical health, housewives report worse health, and unemployed report the worst health (Verbrugge, 1983; Brenner and Levy, 1987; McDonough et al., 2002; Artazcoz et al., 2004). Some studies have found that employed women have less depression, anxiety, and other forms of psychological distress than housewives (Gove and Peterson, 1980; Gore and Mangione, 1983; McDonough et al., 2002).

The 'multiple burden hypothesis' which has dominated for a long time, states that employment would expose women to the stress and hazards of work and thus worsen health. Recent empirical testing of these divergent hypotheses and accumulating evidence shows that, on average, employed women enjoy better health than those who are not employed. It could well be that changes in expected gender roles in society have affected the relationships between

employment, social roles, and health or differences between different societies. Therefore, these hypotheses must be tested considering the context of women's lives — sociocultural, political, and economic.

1.2.4. Marriage

Several authors have shown that marriage is associated with physical health and psychological well-being. Compared to people who are divorced, single, or widowed, the married have better overall well-being (Ross et al., 1990). The non-married people have more physical health problems as indicated by acute conditions, chronic conditions, days of disability, and self-reported health (Berk and Taylor, 1984; Anson, 1989). Being separated, divorced, or widowed has been shown to increase the risk of depression both in population studies (Aro et al., 2001; Carroll et al., 2003) and in studies of clinically depressed patients (Lehtinen, 1994). However, Bebbington (1996) suggested that marital status has different associations with affective disorders in different cultures. Although it seems that marriage protects and improves health, some researchers suggested that it protects men's well-being more than women's (Ross et al., 1990).

Following the Ross et al. (1990), the marriage has a significant, consistent, and positive effect on physical health by increasing social support. The effect of social support on health appears to be mediated by improved psychological well-being, healthier life-style, and better recovery rather than earlier detection and treatment of disease. Other researchers suggest that the quality of social roles, rather than their mere occupancy, is fundamental to understanding the relationships between social roles and health (Barnett, 1994).

We must consider that the results of studies regarding interaction between these areas differ according to the cultural context in which they were studied. Therefore, it is not uncommon that generalized and comparable research results, which have been taken out of their various social contexts, have caused confusion. Most studies in this area have been carried out in developed welfare societies that have witnessed changes in the expected gender roles. Data regarding the relationships between health and marital status in transitional societies are lacking — it is not clear whether the additional social roles are detrimental for women's health or not.

1.2.5. Parenthood

The health effects of being a parent are not still clear. McDonough et al. (2002) found in a representative sample of household residents in Canada that the women living with their children reported less distress and were less likely to report chronic health problems than non-parenting women even though they experienced problems with their children and more social life stress. Other

studies have confirmed that children at home decrease the psychological well-being of parents or have no impact on it (Gore and Mangione, 1983; Ross et al., 1990; Noor, 1996). Kandel et al. (1985) found that positive effects of children on the health and well-being of their parents appear only after the children leave home. Some researchers found that positive effects realized in the best circumstances, considering the sufficient family income, the mother's paid employment, available and affordable child care services, and support from husbands or other relatives in the household in the form of emotional support and shared participation in child care (Ross et al, 1990). Similarly, Bartley and Sacker (1999) indicated that motherhood could be health-enhancing under some conditions and health-damaging under others.

In conclusion, women's social roles combined together with socio-economic inequality form a powerful explanatory framework for variations in women's health. Therefore, more studies are needed to better understand these relationships in different societies.

1.3. Physical activity and health

Physically active lifestyle is a determinant of health with a major influence on the morbidity and the mortality of populations (Dishman et al., 2004). Social habits during the last century have brought about a decrease in the amount of physical activity. In this context leisure-time physical activity has emerged as an important preventive action against chronic diseases, especially taking into account the high prevalence of sedentary occupations. Regular physical activity is linked to improved physical and psychological health through all human developmental stages in both normal and disordered populations (WHO, 2003). For this reason, some agreement has been reached concerning the necessity to persuade the general population to increase their physical activity (ACSM, 1978; ACSM, 1990; USDHHS, 1996; ACSM, 1998; USDHHS and USDA, 2005). Increasing the levels of participation in physical activity is now recognized as a major public health challenge (Pate et al., 1995; Blair and Connelly, 1996; USDHHS, 1996; Vuori, 1998; WHO, 2003).

Physical activity is defined as "any bodily movement produced by the skeletal muscle that results in energy expenditure" (Caspersen et al., 1985). Health-enhancing physical activity is any form of physical activity that benefits health and functional capacity without undue harm or risk. Physical activity can be categorized in various ways, including type, intensity, and purpose. The physical activity of a person or group is frequently categorized by the context in which it occurs. Common categories include occupational, household, leisure time, and transportation.

Benefits of physical activity are evident both at low- and high-intensity activity levels (Paffenbarger et al., 1986; Powell et al., 1987). Indeed, re-

searchers have argued that the greatest potential for health benefits would accrue from making sedentary adults moderately active (Powell and Blair, 1994; Pate et al., 1995; USDHHS, 1996). Despite the well-documented health benefits of physical activity, current estimates suggest that we are in the midst of an epidemic of sedentary behaviour. Worldwide, the World Health Organization estimates that over 60% of adults are not active enough to benefit their health (WHO, 2003). Results of the recent Eurobarometer survey of physical activity, including the European Union member states, illustrate the wide geographical variability in existing physical activity levels (European Commission, 2003). In Baltic States, participation in leisure-time physical activity has been reported to be generally low (Pomerleau et al., 2000; Puska et al., 2003). In the representative study in 1997 in Estonia 41% of women reported that they participated only in sedentary activities such as reading and watching television during their leisure time and only 9% participate in regular physical activities long enough to work out a sweat at least 3 days a week (Pomerleau et al., 2000). The standardized comparative study between the Finland and Baltic States shows great difference in frequent (2–3 times a week or more) vigorous leisure-time physical activity — Estonian women were likely two times less active than Finnish women (Puska et al., 2003). These differences suggest that barriers and preferences for physical activity are likely to vary across different population and population subgroups, and that physical activity is not merely individual behaviour. Women less likely report a lot or some leisure-time physical activity than men, whereas 50.8% of women in European Union reported none or little physical activity in their leisure time (European Commission, 2003). Gender differences in physical activity level appear already in adolescent years, while boys tend to be more active than girls (Riddoch et al., 2004).

In general, this topic has been understudied in the region of the former Soviet Union. Understanding and influencing the determinants of physical activity in women constitute an important public health challenge.

1.3.1. Relationships between physical activity and physical health

A large number of studies have shown the positive impact of regular physical activity on the human body. Physical inactivity is considered one of the major risk factors for atherosclerotic cardiovascular diseases, which is the prevailing cause of death in developed countries (Morris et al., 1953; Paffenbarger et al., 1970; Fletcher et al., 1992). Epidemiological studies have shown that adults who exhibit higher levels of physical activity have a reduced risk of morbidity and mortality from several chronic diseases including hypertension (Paffenbarger et al., 1983; Blair et al., 1984), stroke (Salonen et al., 1982; Sacco et al., 1998), hyperlipidemia (Halbert et al., 1999), diabetes (Manson et al., 1991), cancers of the colon and reproductive organs (Lee, 1994; Schnohr et al., 2005), and obesity (Haapanen et al., 1997a; DiPetro, 1999). Viru and Smirnova (1995)

indicated that the positive impact of physical activity is related to improvement of general adaptability, a favourable effect on cardio-pulmonary and circulatory systems, and suppression of several pathogenic risks. Some of the health-related problems thought to benefit from physical activity are specific to women, or particularly prevalent among them, including the osteoporosis (Uusi-Rasi et al., 1998; Vuori, 2001), breast cancer (Thune and Furberg, 2001), and ovarian cancer (Schnohr et al., 2005).

However, physical activity, in particular vigorous physical activity, is not without risks. Sport injuries and the transient risk of sudden cardiac arrest are the most hazardous direct complications of vigorous exercise. Women may additionally suffer from the 'female triad' (disordered eating, amenorrhoea, and osteoporosis) (Sluijs et al., 2003).

1.3.2. Relationships between physical activity and mental health

Recent reviews of the vast literature on the relationships between physical activity and mental health are in broad agreement that the two are positively associated (Dishman et al., 2004). The general hypothesis is that people who are physically active or have higher levels of cardiorespiratory fitness have an enhanced mood (less negative and greater positive affect), higher self-esteem, greater confidence in their ability to perform tasks requiring physical activity, and better cognitive functioning than sedentary persons or those who are less physically fit (USDHHS, 1996). Since up to 20% of the population may suffer from some form of mental illness (Kessler et al., 1994b; Jenkins et al., 1997; Lavikainen et al., 2000), and women experience psychological and psychosomatic disturbances more often than men (Kessler et al., 1993; Lehtinen and Joukamaa, 1994; Bebbington, 1996; Lepine et al., 1997; Aluoja et al., 2002; Mazure et al., 2002; Blehar and Keita, 2003), it is important for health professionals to consider how to prevent this problem.

Most epidemiological researches among men and women suggest that physical activity may be associated with reduced symptoms of depression (Farmer et al., 1988; Ross and Hayes, 1988; Stephens, 1988; Stephens and Craig, 1990; Camacho et al., 1991), clinical depression (Weyerer, 1992; Dunn et al., 2005), symptoms of anxiety (Ross and Hayes, 1988; Stephens, 1988), improvements in positive affect (Stephens, 1988; Stephens and Craig, 1990), and general well-being (Stephens, 1988), but not all results did not reach a high level of statistical significance (Cooper-Patrick et al., 1997). The positive relationship between physical activity and mental health was demonstrated by Stephens (1988) in a cross-sectional study, by Farmer et al. (1988), and Camacho et al. (1991) in prospective studies, and by several randomized controlled trials (Labbe et al., 1988; Dunn et al., 2005). In general, inactive persons are twice as likely to have symptoms of depression than more active persons (USDHHS, 1996).

1.3.3. Physical Activity Recommendations

Throughout time several researchers and organizations have suggested rather different criteria for physical activity to promote health. Starting from suggestions only for developing and maintenance cardiorespiratory and muscular fitness, the American College of Sport Medicine (1978; 1990; 1998) established position statements providing recommendations on the quantity and quality of exercise. The recommendations stated that aerobic exercise should be undertaken 3–5 times per week at a vigorous intensity of 60–90 per cent of the maximum heart rate (or 50–85% of VO_2 max) and should be of continuous nature, lasting 15–60 minutes. This recommendation was developed on the basis of evidence from a variety of clinical and randomized controlled trials, which established that individuals who participated with this amount of physical activity could achieve measurable changes in fitness (ACSM, 1978; ACSM, 1990; ACSM, 1998). Despite the fact that this message has been widely publicized, the vast majority of the population has failed to achieve the minimum thresholds. An important change in recommendations took place in 1995 when it was found that even moderate intensity activity can lead to potential health gain amongst sedentary individuals (Pate et al., 1995). New recommendations were more directed to health promotion, changing emphasis from vigorous to moderate intensity from continuous to accumulated activity, and from distinctive periods of exercise to daily physical activity. The purpose of developing recommendations for physical activity is most of all to foster the adoption and maintenance of a physically active lifestyle (USDHHS, 1996; ACSM, 1998; USDHHS and USDA, 2005). The most recent position of the American College of Sport Medicine (1998) further emphasized the complementary nature of active lifestyle and fitness. When interpreting this position, one has to admit that the recommendations should be used in the context of needs, goals, and initial abilities of the participants. The current message for the promotion of physical activity should therefore take a two-step approach: the first step is an active lifestyle — adding physical activity to the daily routine (thirty minutes of moderate physical activity on most days of the week), and the second level is regular exercise — improving fitness by gradually increasing the length and intensity of some bouts of activity (three periods of vigorous activity ≥ 20 minutes weekly) (Biddle and Mutrie, 2003).

Recommendations to promote mental health are not so clearly specified. At present there does not seem any clear dose-response relationship between the intensity or total amount of daily physical activity and depression (Dunn et al., 2001). It appears that being sedentary increases the risk of depressiveness, but the high level of exercise may not be more protective against depressiveness than moderate levels (Farmer, 1988; Stephens, 1988). In the Canada Fitness Survey people were seemingly protected from depressiveness if their daily leisure-time energy expenditure was at least 1 kcal per kilogram of body weight per day (equals about 20 minutes of walking) (Stephens, 1988). Risk of

depressiveness was not further reduced when the energy expenditure was raised to 2 to 5 kcal per kilogram of body weight per day.

Many studies have shown that aerobic exercises and weight/flexibility training are equally effective antidepressants among men and women, minimizing the importance of attaining cardiovascular fitness (Martinsen, 1990; North et al., 1990). Utilizing a randomized and controlled design, Martinsen et al. (1989) studied the effects of eight weeks of aerobic exercise versus strength and flexibility training on depressive symptoms in hospitalized patients. Both study groups achieved significant and similar reduction in depressive scores. Another study found that the activity itself was more important in attenuating depressive symptoms than the resultant cardiovascular fitness derived from vigorous activity (Thirlaway and Benton, 1992).

In a recent review of physical activity and mental health the authors concluded that exercise intensity and duration can be important components of using physical activity therapeutically; continuous moderate-intensity exercise is more effective in improving mood symptoms than an intermittent regimen (Paluska and Schwenk, 2000). The available evidence indicates, however, that increased cardiorespiratory fitness is not necessary for psychological benefits to occur (King et al., 1989; Martinsen et al., 1989; Brown and Wang, 1992; Thirlaway and Benton, 1992). Moreover, a moderate-intensity exercise programme is equally effective in improving general health as a traditional vigorous intensity regimen. Since many people with mental disorders may dislike a vigorous exercise regimen, recommending a continuous moderate-intensity programme of 30 minutes on most days of the week may produce greater adherence and success (Paluska and Schwenk, 2000). Dunn et al. (2005) found that the amount of exercise needed to alleviate depressive symptoms is equivalent to consensus public health recommendations; a lower amount of exercise is not effective and is similar to the placebo effect.

The choice of activity or quality of time may be an important element in achieving psychological benefits from physical activity. Data on the comparative effects of recreation and housework suggest that quality of time, and not merely energy expenditure, must be taken into account in attempts to explain the psychological benefits of physical activity (Stephens, 1988). Previous population studies have shown that the association between physical activity and mental health does not apply equally to all groups, but is more pronounced in women and the elderly (Stephens, 1988).

In general, inactivity is a major source of concern in western countries as well as in Estonia. The determinants of physical activity need to be determined as this would help to focus targeted public health strategies.

1.4. Determinants of Physical Activity

Women consistently have lower rates of participation in leisure-time physical activity than men (Martinez-Conzalez et al., 2001; Macera et al., 2005). Because physical activity plays a vital role in overall health, it is important to identify the determinants that can help increase physical activity rates in women. The known determinants of physical activity can be categorized as personal attributes (demographics, biomedical, psychological), environments (physical, social and cultural, time), and behavioural (aspects of physical activity itself, behavioural characteristics and skills) (Dishman et al., 2004). Increasingly, ecological models of behaviour have been recognized as important for the understanding of physical activity behaviour (Sallis et al., 1998). The ecological model proposed by McLeroy et al. (1988) assumes that health behaviour is determined by five levels of influence: (1) intrapersonal factors (psychological and biological factors and developmental history), (2) interpersonal processes and primary groups (formal and informal social network and support systems, including family, friends, and co-workers), (3) institutional factors (social institutions, such as schools, health agencies, and companies), (4) community factors (relationships among organizations, institutions, and informal networks), and (5) public policy (local, state, and national laws and policies). Ecological models differ from many other theoretical models in that they also emphasize factors outside the individual that influence the behaviour, thus helping to understand the correlates of physical activity in women. Environments that promote increased activity while offering easily accessible facilities and removing real and perceived barriers to exercise routine are likely prerequisites for successful change in exercise behaviour (Dishman and Buckworth, 1997). Researchers have found that social support affects participation in physical activity across the wide range of population groups (Steptoe et al., 1997; Sternfeld et al., 1999; Titze et al., 2005), and there is some evidence that social support is more influential for women, especially support from the family (Steptoe et al., 1997; Leslie et al., 1999).

Alone or in combination, these determinants can enhance or suppress the planning for participation, initial adoption of physical activity, or continued participation or maintenance of physical activity (Dishman et al., 2004). The present study focuses on the personal attributes, namely, the attitudes towards physical activity. Recognizing personal and social environmental barriers to physical activity is a first step toward increasing physical activity (Dishman et al., 2004). Earliest studies in Europe have shown that in situation where women physical activity level is insufficient, there are a great proportion of respondents (30% in Italy, 38% in Greece, even more that 50% in Germany and Portugal) who agree that they do not need to do any more physical activity than they already do (European Commission, 1999). Understanding the attitudes

associated with physical activity help us in planning interventions for special population subgroups.

In conclusion, recent studies of women's health have shown that mental disorders are among the leading causes of ill health and disability worldwide. Across many nations and cultures women are about twice as likely as men to develop depressiveness. Alone or in combination, the different determinants can enhance or suppress the health status. Studies of socio-economic position and health status in women have shown that reported poor health is most characteristic of individuals at the bottom of the social hierarchy. However, the links between social determinants and health indicators in women in the former communist countries have not been well described as yet. To study cross-national variations around 'general patterns' is valuable because the latter offer clues to more specific cultural and structural factors that are important for developing health policy. In addition to social determinants, it is important to take into consideration the behavioural determinants. There is a growing interest in the role that physical activity could have in preventing the onset of emotional problems and serving as a treatment modality once such problems have developed. The wide variability of studies has included physical activity as an important part of mental hygiene. Studies worldwide have shown that women consistently reveal lower rates of participation in leisure time physical activity than men, and there is a high degree of variation in the proportions of inactive women by countries. Data regarding the prevalence of physical activity and attitudes to physical activity in women in Estonia are lacking. Therefore, as physical activity plays a vital role in overall health, it is important to study the issues that can help increase physical activity in women.

Based on the earlier findings, it was hypothesized in the following study that the extensive socio-economic changes in Estonia have led to health inequalities among women. Women's additional social roles are related to worse health status, and the women's leisure time physical activity is related to better health status compared to inactive women.

2. AIMS OF THE STUDY

The general aim of the present research is to describe the health status (general and mental), physical activity prevalence, and the relationships between health status and physical activity in fertility-age women in a transitional society.

The specific aims of the present dissertation are as follows:

- a) to study the general health status, and relationships between health status and socio-economic correlates among women (Paper I);
- b) to explore the prevalence of depressiveness and the socio-economic correlates in women (Paper II);
- c) to describe relationships between health status and leisure-time physical activity in women (Paper III);
- d) to study the prevalence of physical inactivity and attitudes towards physical activity among women (Paper III).

3. METHODOLOGY

3.1. Participants of the study

The participants for the present descriptive study included 659 18–45-year-old women. Participants were randomly chosen from the Estonian Population Register. The sampling frame was divided into three sampling units (towns, rural towns, and rural areas) and each of them was stratified by three age groups (18–25, 26–35, 36–45-years-old), weighted by a factor of 0.33. The questionnaires were sent by mail to 1,200 women. Respondents remained anonymous. 661 questionnaires were returned, yielding a response rate of 55%. Two returned questionnaires were not appropriate for analysis. No reminder questionnaires were sent out. Out of the respondents 52.9% (n=349) were 18–25, 24.2% (n=159) 26–35 and 22.9% (n=151) 36–45-year-olds. As for residence, 59.9% (n=395) of the respondents were from towns, 12.7% (n=84) from rural towns, and 27.4% (n=180) from rural areas. Data collection took place throughout the year 1996.

3.2. Methods

3.2.1. Assessment of health status

The study focused on three health indicators: perceived general health, general psycho-emotional health, and depressiveness.

Perceived health was elicited by asking the respondents to describe their general health as ‘excellent’, ‘good’, ‘average’, ‘poor’, or ‘very poor’. Perceived health incorporates a variety of physical, emotional, and personal components of health to constitute individual ‘healthiness’ (Lahelma et al., 1999). This indicator was recommended for comparative purposes in a WHO report (De Bruin et al., 1996).

General psycho-emotional health was elicited by the General Health Questionnaire (GHQ) (Goldberg, 1978). The GHQ-40 is a self-administered screening instrument designed to detect current psychological disorders. The GHQ was designed to cover four identifiable elements of distress: depression, anxiety, social impairment, and hypochondriasis (Goldberg, 1972). The reliability of the Estonian language version of the GHQ-40 was assessed by calculating Cronbach’s *alpha* (*alpha* was 0.94). Validation resulted from four factors: anxiety and depressive-symptoms, cognitive impairment, insomnia, and hopelessness/suicidality (Kreegipuu et al., 1997). The questionnaire contains 40 statements about general health and distressing situations. The instrument has a 4-point scale (1–2–3–4); replies are coded as 0–0–1–1. Respondents were given the following instructions:

“We should like to know if you have had any medical complaints, and how your health has been in general over the past few weeks. Please answer ALL the questions on the following pages simply by underlining the answers, which you think most nearly apply to you. Remember that we want to know about present and recent complaints, not those that you have had in the past. It is important that you should try to answer ALL the questions. Thank you very much for your cooperation”.

Respondents were divided into high or low GHQ scorers (cutting point 12) on the basis of the mean value and standard deviation for the general population sample in the Tartu University database. The GHQ was chosen as one of the instruments because it has proved to be a simple, widely applicable, and appropriate instrument for detecting psychologically disturbed persons in both clinical and non-clinical populations (Goldberg, 1978).

Depressiveness was elicited by the Beck Depression Inventory (BDI) (Beck and Steer, 1987). The BDI is a 21-item self-administered instrument for the assessment of the cognitive, affective, and somatic components of depression experienced during the previous two weeks (rated on a 4-point scale of severity, from 0 to 3). The items to assess depressiveness involved the following symptoms and attitudes: mood, pessimism, sense of failure, lack of satisfaction, guilt feelings, sense of punishment, self-dislike, self-accusation, suicidal wishes, crying, irritability, social withdrawal, indecisiveness, distortion of body image, work inhibition, sleep disturbance, fatiguability, loss of appetite, weight loss, somatic preoccupation, and loss of libido (Beck et al., 1988). In the present data the reliability coefficient (Cronbach's *alpha*) for the BDI scale was 0.86. First, the cut-off scores of 0–9 for none or minimal, 10–18 for mild to moderate, 19–29 for moderate to severe, and 30–63 for severe depressiveness (Beck et al., 1988) were used for describing the severity of symptoms in the study group. Second, the subjects were divided into high or low BDI scorers (cut-off point 14) on the basis of the mean values for the general population sample in the Tartu University database. The term ‘depressiveness’ was preferred to ‘depression’ since BDI is an instrument for assessing different components of depression, but it does not constitute the medical diagnosis ‘depression’.

3.2.2. Assessment of physical activity

Physical activity was assessed by one general question to distinguish active people from inactive people by asking the respondents how much of their leisure time weekly they had spent on physical activity that involved sweating and breathlessness during the past year. The subjects were divided into three groups:

- a) active — participating in physical activity three or more times a week;
- b) moderately active — participating in physical activity once or twice a week;
- c) inactive — less than once a week.

Additional aspects of physical activity were assessed — the evaluation of current physical activity level considering sufficiency of providing good health, and the intention to be physically more active.

3.2.3. Assessment of socio-economic variables

The study focused on selected socio-economic variables including education, income, employment status, marital status, and parental role.

Educational level was divided into four levels: ‘basic education’ equals nine years of education, ‘secondary education’ equals an average of 12 years of education, ‘secondary technical education’ equals secondary school plus vocational training, ‘higher education’ means a university degree or a degree from some other institution of higher education. In the analysis the categories of ‘secondary education’ and ‘secondary technical education’ were combined as ‘secondary education’. Those with a ‘higher education’ served as the reference group.

Income was defined on the basis of the respondent’s self-assessment about their household income as ‘more than average’, ‘average’, ‘below average’, and ‘low’. In the data analysis, the categories of ‘below average’ and ‘low income’ were combined as ‘low’. The ‘more than average’ income group served as the reference group.

Employment status was divided into the following groups: ‘employed’, ‘studying’, ‘at home’, ‘unemployed’. Employed women served as the reference group.

The categories of marital status included ‘never married’, ‘married’ or ‘cohabiting’, ‘widowed’, and ‘divorced’. The ‘married’ and ‘cohabiting’ were combined as ‘married’, and ‘widowed’ and ‘divorced’ were combined as ‘formerly married’. Currently married or cohabiting served as the reference group. There was asked whether the household had children or not. Non-parents served as the reference group.

Place of residence was divided into three categories: town, rural town, and rural area.

3.3. Statistical analysis

Data analysis was carried out using the Statistical Analysis System (SAS Institute, 1989).

To determine the health status and to describe the frequency distribution of each variable, a descriptive analysis was obtained using non-parametric statistical tests, χ^2 -statistic were used to determine the statistical differences between the groups. The differences were considered statistically significant at the $p < 0.05$ level. In descriptive analysis the general health categories ‘excellent’

and 'good' were combined as 'good', and 'poor' and 'very poor' were combined as 'poor'.

Logistic regression analysis was used to (a) examine the socio-economic correlates with health status (perceived health, general psycho-emotional health, depressiveness), and (b) to study the potential risk groups of physical inactivity. Multivariate analysis was performed in order to investigate the potential importance of various confounding factors. In the analyses, the dependent variable, perceived health, was dichotomized as 'good health' (those reporting excellent or good health) or 'less than good health' (average and poor health). General psycho-emotional health was dichotomized as 'without psychological disorders' or 'having psychological disorders' (having a GHQ score ≥ 12). Depressiveness was dichotomized as a 'low score' (BDI <14) or a 'high score' (BDI score ≥ 14). Physical activity as a dependent variable was dichotomized and coded as inactive — participating in physical activity less than once a week, or physically active — participating in physical activity 1–2 times or more a week. Logistic regression models were applied to analyse the odds ratios (OR) and their 95% confidence intervals (95% CI) for different groups compared to the reference group. Model 1 included only one exposure variable at a time (education, income, employment status, marital status, parental role) and was adjusted for age. Model 2 was intended to measure the 'net effect' and was mutually adjusted for all socio-economic variables and age simultaneously.

The analysis of variance was used to make comparisons in BDI and GHQ scores between physical activity groups by using Kruskal-Wallis ANOVA and Scheffe's test. The differences were considered statistically significant at the $p < 0.05$ level. The discriminant analysis was used to select variables for describing groups of physically active and inactive women. Analysis was based on all the variables of GHQ, and since variables had a non-normal distribution, stepwise discrimination was used only as an exploratory method. The non-parametric method, with three nearest neighbours, was used for discrimination, and the set of variables with a nearly equivalent error rate in both groups was selected. The mean values were used for the analysis of variables. Based on the selected variables the percentages of subjects classified into active/inactive groups were 75.3% for the active group and 75.5% for the inactive group, respectively.

4. RESULTS

4.1. Perceived general health status and depressiveness in women (Papers I and II)

In this study the women perceived their general health status as follows: 57% reported it as good, 40% as average, and 3% as poor.

The study shows a high level of the mean score and a high prevalence of moderate and severe depressive feelings in women. The mean score of BDI was 10.9 (SD 8.1), ranging 0–51 in the sample of 18–45-year-old women. Twenty one (3.3%) women showed symptoms falling in the range of severe depressiveness (BDI score ≥ 30). Moderate to severe depressiveness scores (BDI score 19–29) were returned by 84 (13.3%), mild to moderate scores (BDI score 10–18) by 201 (31.7%), and none or minimal depressiveness (BDI score 0–9) by 328 (51.7%) respondents.

4.2. Relationships between the perceived general health, depressiveness, general psycho-emotional health, and the socio-economic status (Papers I and II)

The results showed statistically significant socio-economic (education, income) differences in the risk of not having good perceived health and mental health (Table 1).

According to logistic regression analysis, perceived health and depressiveness correlated with education. The likelihood of having perceived health 'less than good' (OR=4.31, 95%CI=2.29–8.22, Model 1) and depressive symptoms (OR=1.99, 95%CI=1.06–3.74) are statistically significantly higher in the lower educational groups compared to the reference group in both models (Table 1). For general psycho-emotional health the odds were higher for the basic educational group (OR=1.58, 95%CI=0.86–2.91, Model 1) and the secondary education group (OR=1.20; 95%CI=0.77–1.88, Model 1), but not significantly.

The income was strongly related to perceived health, general psycho-emotional health, and depressiveness in both models (Table 1). The findings show that the odds adjusted for age for having perceived health 'less than good' (OR=5.43, 95%CI=2.84–11.30, Model 1) or depressive symptoms (OR=5.47, 95%CI=2.44–12.28, Model 1) were significantly higher in the low income group compared to highest income group.

4.3. Relationships between the perceived general health, depressiveness, general psycho-emotional health, and social roles (Papers I and II)

The associations between perceived health, general psycho-emotional health, depressiveness, and marital status revealed that being divorced or widowed compared to married status can be a risk factor of the health for women. For general psycho-emotional health and depressiveness these associations were statistically significant in Model 1 (Table 2). After adjustment for other socio-economic factors, these associations do not remain statistically significant (Model 2, Table 2). The odd ratios adjusted for age showed that divorced women are more at risk to become depressive (OR=2.07, 95%CI=1.12–3.86) and have poor psycho-emotional health (OR=1.86, 95%CI=1.19–2.90) than married women. The perceived health of never married women seems to be better than for married women (OR=0.84, 95%CI=0.57–1.23), but not statistically significantly. The odds adjusted for age and for all socio-economic factors showed that relationships between mental health and marriage (or cohabitation) do not show the clear pattern.

According to the findings of this study, parental status was not significantly related to perceived health and general psycho-emotional health (Table 2). However, the results show that having better psycho-emotional health seems to be common for women with children (OR=0.68, 95%CI=0.46–1.02, Model 1), but not significantly. There was no consistent relationship between parental status and perceived health.

Regarding employment, the results reveal the trend that housewives and unemployed women were more at risk of not having good perceived and general psycho-emotional health than working women. As for perceived health, these associations were significant for housewives in both models (OR=1.71, 95%CI=1.10–2.67, Model 1) (Table 2).

Table 1. Associations of socio-economic variables with perceived 'less than good' health and general psycho-emotional health (GHQ score ≥ 12) and depressiveness (BDI score ≥ 14) in 18–45-year-old women in Estonia

Variables	Perceived health				Psycho-emotional health				Depressiveness				
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		
	%	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI		
<i>Education</i>													
(Higher)	17.6	1.0		1.0	1.0		1.0	1.0		1.0		1.0	
Secondary	68.6	2.78*	1.74–4.52	2.59*	1.58–4.32	1.20	0.77–1.88	1.10	0.69–1.78	1.69*	1.03–2.78	1.93*	1.17–3.49
Basic	13.8	4.31*	2.29–8.22	4.09*	2.09–8.15	1.58	0.86–2.91	1.37	0.72–2.64	1.99*	1.06–3.74	2.75*	1.37–5.62
<i>Income</i>													
(More than average)	10.8	1.0		1.0	1.0		1.0	1.0		1.0		1.0	
Average	33.8	2.65*	1.35–5.61	2.58*	1.30–5.56	2.15*	1.12–4.45	2.21*	1.13–4.62	2.12	0.91–4.96	1.95	0.87–4.95
Low	55.5	5.43*	2.84–11.30	5.03*	2.58–10.65	3.42*	1.82–6.93	3.43*	1.79–7.07	5.47*	2.44–12.28	4.53*	2.12–11.25

% — distribution of variables;

Model 1 values refer to the odds ratio for single variable adjusted for age;

Model 2 adjusted for all socio-economic variables (education, income, marital, parental and employment status) and age at the same time;

* Values are statistically different from the 'reference group' (95% CI for OR does not include 1), reference groups are shown in brackets.

Table 2. Associations of social roles with perceived 'less than good' health, general psycho-emotional health (GHQ score ≥ 12), and depressiveness (BDI score ≥ 14) in 18–45-year-old women in Estonia

Variables	%	Perceived health				Psycho-emotional health				Depressiveness			
		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
		OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<i>Marital status</i>													
(Married)	52.4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Never married	40.5	0.84	0.57–1.23	0.78	0.45–1.36	1.01	0.69–1.49	1.54	0.88–2.76	0.88	0.61–1.26	1.05	0.68–1.62
Formerly married	7.2	1.75	0.93–3.83	1.36	0.69–2.72	1.86*	1.19–2.90	1.52	0.80–2.92	2.07*	1.12–3.86	1.56	0.81–2.97
<i>Parental status</i>													
(Without children)	45.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
With children	54.4	0.79	0.54–1.17	1.25	0.69–2.27	0.68	0.46–1.02	0.56	0.30–1.01	1.0	0.61–1.26	1.05	0.68–1.62
<i>Employment status</i>													
(Employed)	54.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Studying	18.8	0.99	0.60–1.65	0.97	0.56–1.69	0.95	0.57–1.60	1.01	0.58–1.76	1.0	0.61–1.26	1.05	0.68–1.62
At home (housewife)	18.7	1.71*	1.10–2.67	1.74*	1.05–2.90	1.45	0.93–2.27	1.33	0.81–2.20	1.0	0.61–1.26	1.05	0.68–1.62
Unemployed	5.1	1.80	0.86–3.85	1.30	0.60–2.90	1.86	0.90–3.85	1.68	0.79–3.57	1.0	0.61–1.26	1.05	0.68–1.62

% — distribution of variables;

Model 1 values refer to the odds ratio for single variable adjusted for age;

Model 2 adjusted for all socio-economic variables (education, income, marital, parental and employment status) and age at the same time;

* Values are statistically different from the 'reference group' (95% CI for OR does not include 1), reference groups are shown in brackets.

nt — not tested

4.4. Relationships between perceived general health, depressiveness, general psycho-emotional health, and leisure-time physical activity (Paper III)

The physically active women reported their health as follows: 68.7% as good, 30% as average, and 1.3% as poor, the differences in perceived health status between physically active and inactive women were significant ($p < 0.05$; $\chi^2 = 23.1$), Fig 1.

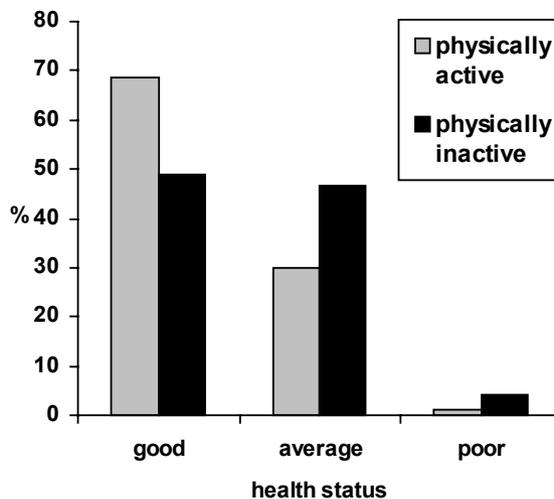


Figure 1. Perceived general health status in physically active and inactive 18–45-year-old women in Estonia.

The results revealed that only 24.4% of physically active women had a high GHQ score while significantly more of moderately active (34.7%) and inactive women (39.9%) had a high score ($p < 0.05$; $\chi^2 = 6.7$), Fig.2.

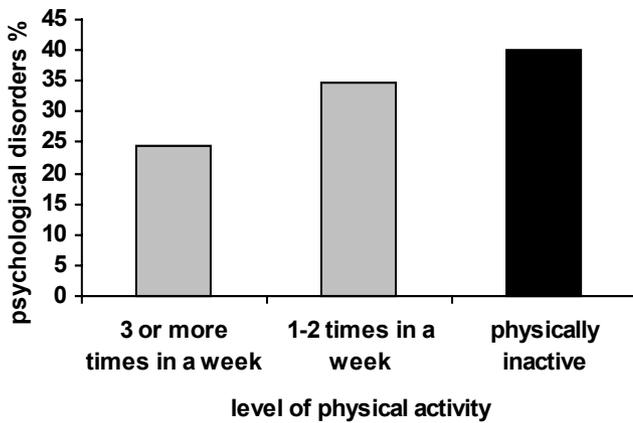
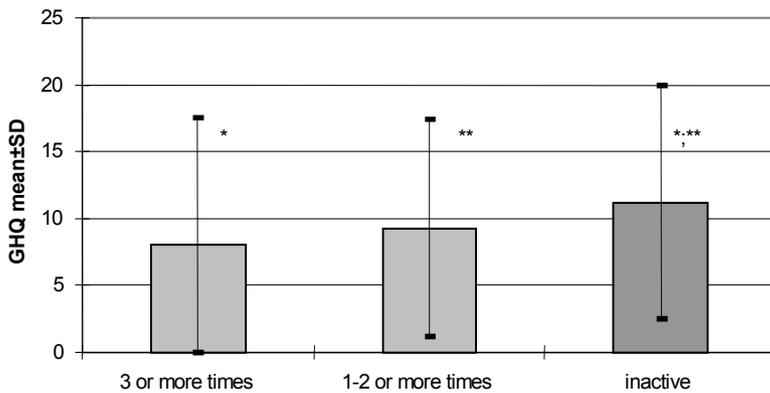


Figure 2. Distribution of psychological disorders (GHQ score ≥ 12) according to the level of leisure-time physical activity in 18–45-year-old women in Estonia

The mean GHQ score was 8.0 for the physically active women, 9.3 for the moderately active women, and 11.2 for the inactive women, Fig.3. The differences in the general psycho-emotional health (GHQ score) between the active and the inactive women were significant ($p < 0.05$). There was no significant difference between the active women and the moderately active women, Fig.3.



Footnote:

* significant difference between the active and the inactive group at the $p < 0.05$ level,
 ** significant difference between the moderately active and the inactive group at the $p < 0.05$ level.

Figure 3. The mean GHQ scores in physically active, moderately active, and inactive women

Relationships between depressiveness and physical activity reveal that only 18.7% of physically active women were high scorers (BDI \geq 14) and 21.9% of moderately active women while significantly more (35%) of the physically inactive women had a high BDI score ($p<0.05$; $\chi^2= 16.9$), Fig. 4.

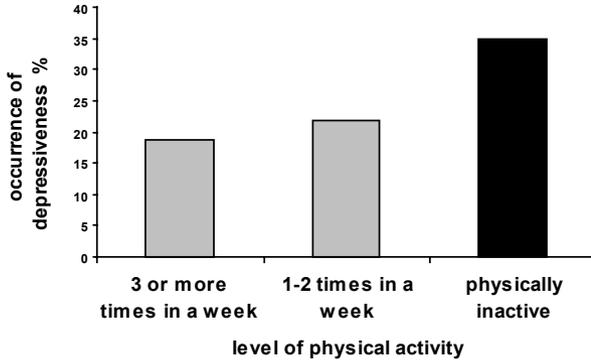
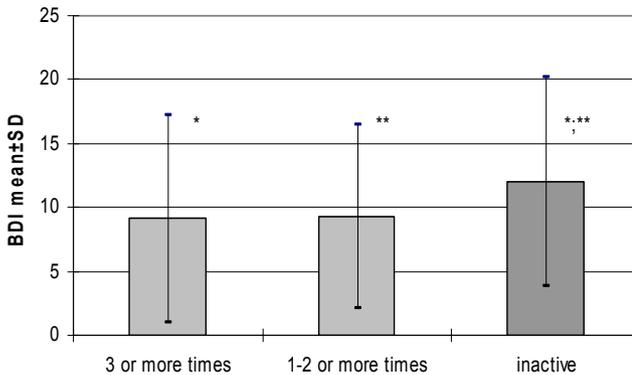


Figure 4. Distribution of depressiveness (BDI score \geq 14) according to the level of leisure-time physical activity in 18–45-year-old women in Estonia

The mean BDI scores for the physically active women (9.1) and the moderately active women (9.3) were significantly lower than for the inactive women (12.0), ($p<0.05$). There was no significant difference between the physically active women and the moderately active women (Fig. 5).



Footnote:

** significant difference between active and the inactive group at the $p<0.05$ level, ** significant difference between moderately active and the inactive group at the $p<0.05$ level.*

Figure 5. The mean BDI scores in physically active, moderately active and inactive women

Stepwise discriminant analysis, based on GHQ, was used to select variables for describing groups of physically active and inactive women. The stepwise discriminant analysis resulted in 9 variables from 40 to distinguish physically active and inactive women (Table 4). The physically active women expressed lower levels of mean values, reflecting better psychological well-being. Based on these 9 variables the percentages of subjects classified into active/inactive groups were 75.3% for the active group and 75.5% for the inactive group, respectively.

Table 4. Selected variables by stepwise discriminant analysis based on General Health Questionnaire (GHQ) for physically active and inactive groups

Variables	Mean scores of GHQ variables of physically active women	Mean scores of GHQ variables of physically inactive women
Positive attitude to life	1.3	1.5
Usefulness	1.8	1.9
Feeling warmth towards one's family	1.8	1.9
Moodiness	2.2	2.5
Taking challenges	1.9	2.1
Enjoying activities	2.0	2.2
Handling serious situations	2.0	2.1
Needing rest	2.3	2.5
Feeling sick	1.7	2.0

4.5. Prevalence of physical inactivity and attitudes towards physical activity (Paper III)

12.7% of the women had been physically active three or more times a week during their leisure time in the previous year, participating in physical activity that involved sweating and breathlessness — 34.8% 1–2 times a week and 52.5% less than once a week (Fig.6).

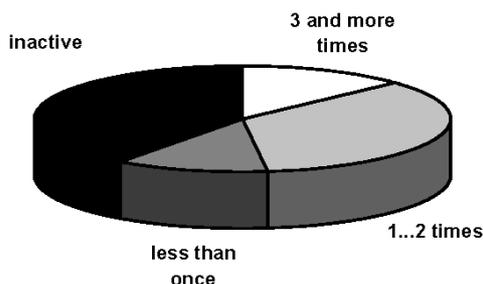


Figure 6. Level of weekly leisure-time physical activity in 18–45-year-old women in Estonia.

The study shows a high prevalence of women who reported that their current physical activity level was insufficient to provide good health and fitness (Fig. 7).

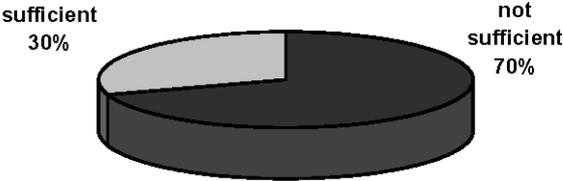


Figure 7. 18–45-years-old Estonian women’s perception of their own current physical activity level for providing good health and fitness.

The results also reveal that most women would like to be physically more active (Fig. 8).

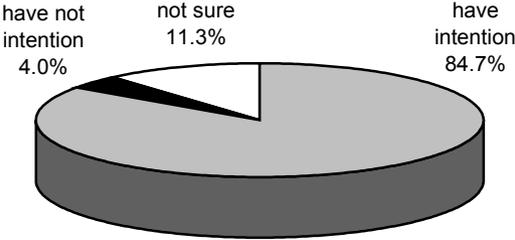


Figure 8. 18–45-year-old Estonian women’s intention to be physically more active.

5. DISCUSSION

5.1. Perceived general health status and depressiveness in women

Perceived health presumably offers a summary statement of how the individual perceives various health conditions. In this study the women perceived their general health status as follows: 57% reported it as good, 40% as average, and 3% as poor. Comparing these findings with the data of other studies in European countries (European Commission, 1997), it is obvious that in similar geographical and cultural conditions, but owing to the different economic and political backgrounds, a lower percentage of women from a transitional society report good health. Similar results were reported in a previous study in 25 western and eastern European countries (Carlson, 1998). That study established the so-called European health divide, documented for mortality, which is also noticeable in perceived health.

Depressive symptoms are the most prevalent psychiatric symptoms in the community and are strongly associated with the development of depressive disorder. Depression is particularly devastating for women, whereas women have a 2:1 greater risk than men for most types of depression (Lehtinen and Joukamaa, 1994; Bebbington, 1996; Lepine et al., 1997; Blehar and Keita, 2003). The study shows a high level of the mean score and a high level of depressiveness in Estonian women. The prevalence of depressive symptoms indicating at least mild depression (48.3% of respondents) is much higher than in Western countries (Aro et al., 2001). A recent study of Finnish adult twins (Romanov et al., 2003) showed that the mean score of BDI in women was about twice lower than in this study. However, the ODIN study of general population in five European countries reported considerable variability in the prevalence of depressive disorders in women — from 2.6% to 24.0% across the study sites (Ayuso-Mateos et al., 2001). The high prevalence rate in this study can be explained in several ways. First, the regional differences in the prevalence can be explained mostly by differences between the regions in the proportion of the population in lower social classes. This study was carried out at the time when Estonia was witnessing rapid economic changes that led to socio-economic differentiation and poverty. Second, as a self-rate instrument, the BDI provides a rough estimate of depressiveness and can not be directly compared to the research findings where structured psychiatric interviews were used. Nevertheless, in general the high prevalence of psychosomatic disorders in women seems to be common for East European societies (Wroblewska, 2002).

5.2. Relationships between perceived general health, depressiveness, general psycho-emotional health, and socio-economic status

The findings of the study showed significant differences in the risk of not having good perceived health and mental health in women with different educational and income status. Both dimensions of socio-economic status reflect different resources (e.g. education indicates knowledge, credentials, and social networks; income provides access to better housing, nutrition, and health care) (Adler and Snibbe, 2003). In the present study the likelihood of having perceived health ‘less than good’ and depressive symptoms were significantly higher in the lower educational groups compared to the reference group. The same tendency was reported in previous studies (Arber, 1997; Aro et al., 2001; McDonough et al., 2002; Malmberg et al., 2005). As expected, income was significantly related to perceived health, general psycho-emotional health, and depressiveness, which is consistent with some other studies (Wroblewska, 2002; Aro et al., 2001; Mazure et al., 2002). Nevertheless, the observed higher likelihood of depressiveness at lower income group was more higher than in studies in Western countries — previous studies showed that in general the lowest income group is twice as likely to develop depressive disorders (Weich and Lewis, 1998; Aro et al., 2001). In this study the odds of having depressive symptoms were remarkably higher in the lower income group compared to the highest income group. A possible explanation might be the higher level of the economic strain in Estonian society. The results of this study confirmed that in transitional society women’s health is significantly associated with economic inequality.

5.3. Relationships between perceived general health, depressiveness, general psycho-emotional health, and social roles

In the present study the associations between perceived health, general psycho-emotional health, depressiveness, and marital status revealed that being divorced or widowed is a risk factor for women’s health. These associations were statistically significant for general psycho-emotional health and depressiveness. Similarly, being separated, divorced, or widowed has been shown to increase the risk of depression both in previous population studies (Aro et al., 2001; Carroll et al., 2003) and in studies of clinically depressed patients (Lehtinen and Joukamaa, 1994). As for the perceived health, general psycho-emotional health, and depressiveness of never married and married women, the results did not show any consistent pattern. Although the associations are statistically non-significant, it appears that the perceived health of never married women could

be better than that of married women. This trend is in contradiction with some previous studies. These studies found that non-married women have more physical health problems, as indicated by acute and chronic conditions, days of disability, and self-reported health (Berk and Taylor, 1984; Anson, 1989). However, the present study found that with regard to psycho-emotional health marriage (or cohabitation) seems to be a protective factor. Similar results were found in earlier studies, which showed that non-married people have higher levels of depression, anxiety, and other forms of psychological distress (Gore and Mangione, 1983). Probably, marital status has different associations with affective disorders in different cultures as suggested by Bebbington (1996).

The health effects of parenthood are not consistent. A number of theorists and researchers challenge the view that children increase one's well-being (Ross et al., 1990) while others found that children decrease the psychological well-being of parents or have no impact on it (Gore and Mangione, 1983; Ross et al., 1990; Noor, 1996). The findings of this study reveal that there are no statistically significant relationships between having children, perceived health, and general psycho-emotional health. However, the results show a trend that parenthood seems to have negative relationships with perceived health after adjusting income, education, marital status, and employment, and positive relationship with psycho-emotional health. Consequently, having children may have a negative impact on the general health status of women, but it could at the same time positively affect their psycho-emotional health, which involves many components, such as self-management, social success, and normal functioning in everyday life. Overall, it seems that motherhood is a health-enhancing factor under some conditions and health-damaging under others and could depend on social support and shared participation in child care (Ross et al., 1990).

Regarding employment, the findings of this study show that the housewives and unemployed women were more at risk of not having good perceived and general psycho-emotional health than working women; as for perceived health, these associations were statistically significant for housewives. Therefore, the results of the study do not support the viewpoint that employment exposes women to stress and occupational hazards, and thus deteriorate health (Gove, 1984). The results of this study are in accordance with studies that found that employed women have less psychological distress than housewives (Gore and Mangione, 1983; McDonough et al., 2002) and are healthier than housewives and non-employed women (Brenner and Levy, 1987; Artazcoz et al., 2004).

Therefore, the results of present study suggest that multiple roles can imply multiple attachments to the community, which is likely to enhance an individual's sense of purpose and meaning in life and to promote women's health (Arber, 1997). These results are in line with several recent studies in western countries, such as Finland, Britain, and the Netherlands, which show that combining a job outside the home and childcare is not detrimental to women's health (Fokkema, 2002; Lahelma et al., 2002).

5.4. Relationships between perceived general health, depressiveness, general psycho-emotional health, and leisure-time physical activity

The physically active women reported significantly better health than inactive women, which is in accordance with the other studies (Ulmer et al., 2001; Malmberg et al., 2005). Previous studies of physical activity, fitness, and all-cause mortality in women confirm that they are inversely associated (Blair et al., 1993; Lissner et al., 1996). It means that leisure time physical activity is closely associated with better perceived and actual health in women. However, Malmberg et al. (2005) in prospective follow-up study of middle-aged and older adults shows protective effect of a moderate to high level of weekly global leisure time physical activity against the risk of decline in perceived health among men but not among women. Among women, results revealed an increased risk of decline in perceived health only with fitness activity at less than once a week.

The results show that physical inactivity is associated with increased risk of poor mental health and depressiveness. Women involved in leisure-time physical activity at least once a week had significantly lower GHQ and BDI scores, reflecting better psychological well-being and less depressiveness, compared to inactive women. These findings confirm the claim by Stephens (1988), who showed in a large cross-sectional study that physical activity is positively associated with good mental health, particularly in women. Similarly, Farmer et al. (1988) using a large prospective study found that physical inactivity may be a risk factor for depressive symptoms and that low levels of recreational activity at baseline predicted depression 8 years later in white women who had not been depressed previously.

There was a significant difference in mental health between the inactive and moderately active groups, but there were no significant differences between the groups who exercised three or more times a week and groups who exercised 1–2 times a week. This finding is in accordance with previous studies that revealed that high levels of physical activity may not be more protective against depression than moderate levels (Farmer, 1988; Stephens, 1988). It means that even a low level of physical activity (1–2 times a week) can be positively related to women's mental health. Thus, although exercising three or more times a week may be necessary for a positive effect on the cardiovascular system, even rather small amounts of exercise may improve one's mental.

In general, the findings of this study are in line with the recommendation that many significant health benefits can be achieved by switching from a sedentary lifestyle to a minimal level of physical activity (USDHHS, 1996).

The findings of this study also show that at least 1–2 times weekly physically active women had a more positive attitude towards life, they had a better perception of their role, they felt more emphatic towards their families and friends, they felt less moodiness, they enjoyed their activities and themselves

more, they handled serious situations more easily, they had less need of rest and complained less about ailing health. These results can be explained according to the hypothesized plausibility of cognitive effects of physical activity, namely enhancement of one's positive self-esteem, which is important for maintaining a favourable emotional balance (Dishman et al., 2004).

Whether physical activity affects the mental health is difficult to answer by the present study. Although we provided evidence by descriptive research about relationships between physical activity and mental health, further research is needed to state cause-effect relationships and to clarify the mechanisms underlying the association between physical activity and mental health.

5.5. Prevalence of physical inactivity and attitudes to physical activity

The study shows that the Estonian women's prevalence of inactive women is remarkably high — 52.8%. This observation agrees with other previous survey conducted in Estonia which showed high proportion of inactive women — 41% reported that they participated only in sedentary activities such as reading and watching television during their leisure time (Pomerleau et al., 2000). Finding that 12.7% of the women have participated in vigorous physical activity three or more times a week during their leisure time are in accordance with the representative study in Estonia, which reveal that only 9% of women participate in regular physical activities long enough to work out a sweat at least 3 days a week (Pomerleau et al., 2000). The results of a recent Eurobarometer survey of physical activity reveal that 50.8% of women in European Union reported none or little physical activity in their leisure time, and 65% of women did not report any vigorous physical activity in the past week (European Commission, 2003). Similarly, a high level of women's inactivity shows ATTICA study where 52% of studied women were classified as physically inactive (Pitsavos et al., 2005). However, the present study illustrates the Estonian women's positive attitude to physical activity as a remedy to promote their health. Most women thought that their current physical activity level was insufficient, and more than 80% of the women would like to be physically more active while only 4% did not find that they need to be more physically active. For example, a PAN European Survey shows that there is a great proportion of respondents (30% in Italy, 38% in Greece, even more than 50% in Germany and Portugal) who agree that they do not need to do any more physical activity than they already do, whereas respondents physical activity level is insufficient (European Commission, 1999). According to Koivula (1995), the relatively low level of women's participation in sports and physical activities is clearly related to societal beliefs about the gender-related nature of these activities, and the constraining nature of these beliefs on women's behaviour. Following Ståhl et al. (2001) the strongest

independent predictor of being physically active is the social environment (family, friends, school, and workplace). Social support and attitudes are critical for contemplators, for individuals in the preparation stage or for those who have dropped out of the action phase (Prochaska and DiClemente, 1983; Prochaska et al., 1994; Dishman et al., 2004). It can well be that in the Central and Eastern European societies, such as Estonia, women's physical activity is not socially sufficiently supported. This viewpoint was confirmed by a Polish study, which showed that previously women were regarded merely as homemakers during the leisure time while physical activity was considered to be the privilege of men (Siemienska, 1998). In order to see positive changes in the level of physical activity among population, long-term multisectoral programs and policies are needed (Vuori et al., 2004).

In general, these findings suggest that physical inactivity is a major source of concern in Estonia, as it is in western countries. The strategies to promote greater participation in physical activity need to focus more on social norms, support and accessibility regarding active lifestyles in a wider range of women's settings and circumstances. Researches on the social and personal factors that influence the adoption and maintenance of more active lifestyles are needed.

5.6. Methodological consideration of the study

Some limitations of this study should be discussed. First, the prevalence study design has a common problem of validity concerning casual relationships. We must consider these results with caution, since the variables are related, although this does not necessarily mean that one causes the other.

The other limitation is the relatively low response rate. One might suppose that this can be explained by the fact that in 1996 many people were not yet used to answering postal questionnaires, which was then a new form of research in Estonia. Similar low response rates for health questionnaires have also been recorded for other health studies in Central and East European countries (Bobak et al., 2000).

Thirdly, depressiveness was identified by a self-reported questionnaire, which means that the prevalence of depressiveness obtained in our study cannot be compared directly to studies based on structured diagnostic interviews.

Fourthly, an important issue to consider when evaluating the association between physical activity and health outcomes is the physical activity assessment method that was used. In this study physical activity was assessed in general question by asking the respondents the frequency of exercise-induced sweating. Surveys based on self-reported physical activity have been the most commonly used method of estimating physical activity patterns of a population (USDHHS, 1996). Questions usually asked include the frequency and duration of specific activities over a defined time period. Nevertheless simplified approaches for the assessment of physical activity have also been used, such as

self-assessment of physical activity level or the frequency of physical activity induced sweat episodes (Washburn et al., 1987). A single question concerning the frequency of exercise-induced sweating has been validated by several authors (Siconolfi et al., 1985; Washburn et al., 1987; Kohl et al., 1988; Gruner et al., 2002). The results suggest that this approach may provide useful information of physical activity for epidemiologic research.

6. CONCLUSIONS

1. Perceived health and general mental health in women is related to income and educational inequality. Women with a lower socio-economic status have a significantly higher risk of having perceived health “less than good” and more psychological disorders.
2. The women employment status and parental status is not related to poorer health status.
3. The prevalence of depressive symptoms indicating at least mild depressiveness was high — experienced by about half of respondents. The higher risk of depressiveness is associated with the lower educational level and lower income.
4. In leisure time physically active women experienced significantly better general psycho-emotional health, less depressiveness, and better general health status. Inactive women were twice as likely to have symptoms of depressiveness as women having physical activity three or more times a week. Even a low level of physical activity in leisure time (1–2 times per week) was positively related to women’s mental health.
5. About half of the women were physically inactive. However, the attitudes towards physical activity were positive — most of the women would like to be physically more active than they currently are.

7. SUMMARY IN ESTONIAN

Fertiilses eas naiste üldine tervisehinnang ja psühho-emotsionaalne tervis Eestis: seosed sotsiaal-majanduslike tegurite ja kehalise aktiivsusega

Käesoleva töö eesmärgiks oli uurida naiste terviseseisundi sotsiaal-majanduslikke erinevusi ning terviseseisundi ja kehalise aktiivsuse vahelisi seoseid Eestis. Töös püstitati järgmised ülesanded: 1) analüüsida tervisehinnangu seoseid sotsiaal-majanduslike teguritega, 2) uurida depressiivsuse levimust ja seoseid sotsiaal-majanduslike teguritega, 3) kirjeldada terviseseisundi ja vaba aja kehalise aktiivsuse vahelisi seoseid, 4) selgitada kehalise mitteaktiivsuse levimusmäär ja suhtumine kehalisse aktiivsusesse.

Uuring viidi läbi levimusuuringuna Eesti elanike seas. Valimi moodustasid 1200 naist vanuses 18–45 aastat. Vaatlusalused valiti juhuvalimina Eesti Rahvastikuregistri alusel. Esindatud olid nii linnade, alevite kui ka maapiirkondade naised. Ankeedi tagastas 659 naist, seega oli vastanute protsendiks 55%. Uurimismeetodiks oli anonüümne ankeetküsitlus, mis viidi läbi posti teel. Psühho-emotsionaalse seisundi hindamiseks kasutati kaht mõõtevahendit: 1) Üldine Terviseküsimustik-40 (*General Health Questionnaire — GHQ-40*) (Goldberg, 1972); 2) Becki Depressiooni Küsimustik (*Beck Depression Inventory — BDI*) (Beck and Steer, 1987). Sotsiaal-majanduslikest teguritest uuriti alljärgnevaid sotsiaal-majanduslikke tegureid: haridustase, sissetulek, majanduslik aktiivsus, perekonnaseisund ja laste olemasolu. Seoseid tervisehinnangu ja sotsiaal-majanduslike tegurite vahel hinnati logistilise regressioonanalüüsiga; gruppide võrdlusi dispersioonanalüüsiga, mITTenormaaljaotuste puhul kasutati Kruskal-Wallis'e ja Scheffe testi.

Uuringutulemused näitasid, et veidi üle poolte küsitletud naistest leiab oma tervise olevat hea või väga hea. Ilmnes uuringus osalenud naiste suhteliselt kõrge depressiivsuse levimusmäär — ligi pooltel naistel esineb risk depressiivsete häirete osas. Naiste tervisehinnang on seotud nende sotsiaal-majandusliku staatusega. Põhi- või keskharidusega naiste hulgas esines vähem hea või väga hea tervisehinnanguga naisi võrreldes kõrgharidust omavate naistega. Sarnaselt ilmnes eristumine haridustaseme ja depressiivsuse seoste vahel — kõrgharidusega naistel on oluliselt väiksem tõenäosus depressiivsuse esinemiseks. Sissetuleku ja tervisehinnangu vahel oli tugev seos — majanduslikult hästi kindlustatud naiste hulgas esines märkimisväärselt suurem hea ja väga hea tervisehinnanguga naiste levimusmäär kui majanduslikult vähemkindlustatute hulgas. Sama ilmnes ka psühho-emotsionaalse tervise osas. Naiste perekonnaseisund, laste olemasolu ja majanduslik aktiivsus ning terviseseisund ei olnud oluliselt seotud. Risk halvema psühho-emotsionaalse seisundi osas on eelkõige lahutatud/lesestunud naistel. Käesoleva uurimuse põhjal ei olnud laste olemasolu seotud negatiivsemate tervisehinnangutega. Ilmnes, et tööel kaivate naiste

üldine tervisehinnang on parem kui kodustel naistel. Tervisekäitumise osas uuriti nädala lõikes vabal ajal kehalise aktiivsusega tegelemist, kusjuures silmas peeti sellise intensiivsusega kehalise aktiivsust, millega kaasneb hingeldamine ja higistamine. Toodud kriteeriumi järgi on nädala jooksul 3 ja enam korda kehaliselt aktiivsed 12.7% naistest ning kehaliselt mitteaktiivsed 52.8%. Samas on naiste suhtumine kehalisse aktiivsusesse positiivne — enamus naistest sooviksid olla kehaliselt aktiivsemad kui nad seda praegu on. Kehalise aktiivsuse ja terviseseisundi seoste analüüs näitas, et mitteaktiivsete ja vähemalt 1–2 korda nädalas kehaliselt aktiivsete naiste tervisehinnang erineb oluliselt — mitteaktiivsete naiste hulgas on vähem naisi, kes hindavad oma tervise heaks või väga heaks. Kehaliselt mitteaktiivsete naiste hulgas esineb enam psühho-emotsionaalset häiritust ja ligi kaks korda rohkem depressiivsust kui kehaliselt aktiivsete naiste hulgas. Kehaliselt mitteaktiivsetel naistel on ka keskmine depressiivsuse punktisumma (BDI skoor) oluliselt kõrgem kui kehaliselt aktiivsetel. Erinevused psühho-emotsionaalses seisundis ja depressiivsuses ilmnesid mitteaktiivsete naiste ja nädalas vähemalt üks kord kehaliselt aktiivsete naiste vahel; samas ei leitud olulisi erinevusi kahe kehaliselt aktiivse rühma vahel.

Järeldused:

- 1) naiste terviseseisund on seotud haridustaseme ja majandusliku kindlustatusega — madalam sotsiaal-majanduslik staatus suurendab oluliselt riski halvema terviseseisundi osas;
- 2) töö käimine ja laste olemasolu ei ole seotud naiste halvema terviseseisundiga;
- 3) naiste depressiivsuse levimusmäär on kõrge — ligi pooltel naistel ilmnesid vähemalt kerge depressiivsuse näitajad. Suurem risk depressiivsuse osas esines madalama haridustaseme ja sissetulekuga naistel;
- 4) naised, kes on vabal ajal kehaliselt aktiivsed, on parema üldise tervisehinnanguga, neil esineb vähem psühho-emotsionaalseid häireid ja depressiivsust võrreldes mitteaktiivsetega. Kehaliselt mitteaktiivsetel naistel esineb ligi kaks korda suurem risk depressiivsuse osas võrreldes kehaliselt aktiivsete naistega. Isegi vaid korra nädalas kehaliselt aktiivne olemine on seotud parema vaimse terviseiga;
- 5) ligi pooled naised on kehaliselt mitteaktiivsed, kuid samas on naiste suhtumine kehalisse aktiivsusesse positiivne — enamus naistest sooviksid olla kehaliselt aktiivsemad.

Kokkuvõtvalt: saadud tulemused kinnitasid, et üleminekuühiskonnas on naiste tervis oluliselt seotud sotsiaal-majandusliku staatusega (haridustaseme ja majandusliku kindlustatusega), tingides ebavõrdsust tervises. Vaimse tervise osas ilmnes depressiivsete häirete kõrge levimusmäär. Silmas pidades kehalise aktiivsuse võimalikku positiivset mõju tervisele tuleb senisest enam pöörata tähelepanu naiste kehalise aktiivsuse arendamisele, kaasates riskigruppe läbi erinevate terviseedenduse programmide.

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10. PUBLICATIONS

CURRICULUM VITAE

Merike Kull

Citizenship: Estonian
Date of birth: April 15, 1967
Address: Institute of Exercise Biology and Physiotherapy,
University of Tartu, Jakobi 5 Tartu 51014, Estonia
Telephone: +372 737 5367
E-mail: Merike.Kull@ut.ee

Education

1985–1989 Undergraduate studies (BSc), Faculty of Exercise and Sport Sciences, University of Tartu
1990–1993 Master's studies (MSc), Faculty of Exercise and Sport Sciences, University of Tartu
1994–2000 Doctoral studies, Department of Pedagogy, University of Tartu

Professional employment

Since 1995 Lecturer (in health education), Institute of Exercise Biology and Physiotherapy, University of Tartu

Specialized Courses

2001 WHO, European Network of Health Promoting Schools, course "Evaluation on Health Promoting Schools", Switzerland
2000 Oxford University, Institute of Health Sciences
2000 University of Sydney, course "Health Promotion Evaluation"
1999 WHO, course "Lifeskills training for teacher trainers in the Baltic States", Latvia
1996 University of Helsinki, course "Virolais-suomalainen monimuoto-opetuksen koulutusohjelma"
1995 University of Jyväskylä, course "Terveyden edistäminen"

Scientific activity

Main research area:

Health status and health behaviour in population (adults, schoolchildren) and school health education. The total number of scientific publication is 45, including 5 articles in international peer-reviewed journals.

Membership in professional organizations

- Vice-president of the Estonian Olympic Academy
- Expert-consultant of the European Council Pompidou Group in Drug Prevention Programmes
- Member of the Council of Human Studies at the Ministry of Education and Research
- Member of the Board of the Estonian Health Education Association

CURRICULUM VITAE

Merike Kull

Kodakondsus: Eesti
Sünniaeg: 15. aprill 1967
Aadress: Spordibioloogia ja füsioteraapia instituut, Tartu Ülikool,
Jakobi 5 Tartu 51014
Telefon: 737 5367
E-mail: Merike.Kull@ut.ee

Haridus

1985–1989 Tartu Ülikool, kehakultuuriteaduskond, bakalaureuseõpe,
liikumise- ja sporditeadused
1990–1993 Tartu Ülikool, magistriõpe, liikumise- ja sporditeadused
1994–2000 Tartu Ülikool, pedagoogikaosakond, doktoriõpe

Erialane teenistuskäik

Alates 1995 Tartu Ülikool, Kehakultuuriteaduskond, spordibioloogia ja
füsioteraapia instituut, tervisekasvatuse lektoraat, lektor

Erialane esesetiendus

2001 WHO, European Network of Health Promoting Schools, kursus
“Evaluation on Health Promoting Schools”, Switzerland
2000 Oxford University, Institute of Health Sciences, teadustöö
2000 University of Sydney, kursus “Health Promotion Evaluation”
1999 World Health Organisation, kursus “Lifeskills training for
teacher trainers in the Baltic States”, Latvia
1996 Helsingin Yliopisto, kursus “Virolais-suomalainen
monimuoto-opetuksen koulutusohjelma”
1995 Jyväskylän Yliopisto, kursus “Terveyden edistäminen”

Teadustegevus

Peamised uurimisvaldkonnad: tervise seisundi ja -käitumise uurimine elanikkonnas ning tervisekasvatus koolis. Kokku on ilmunud 45 teaduspublikatsiooni, sh 18 teadusartiklit, neist 5 rahvusvaheliselt eelretsenseeritavates ajakirjades.

Erialaorganisatsioonid

- Eesti Olümpiaakadeemia asepresident
- Euroopa Nõukogu ekspert-konsultant uimastiennetusprogrammide osas
- Teadus- ja Haridusministeeriumi ja Riikliku Eksami- ja Kvalifikatsiooni-keskuse juures asuva üleriigilise inimeseõpetuse ainenõukogu liige
- Eesti Tervisekasvatuse Ühingu juhatuse liige