The association between physical activity, mental health, and personality: The HUNT study

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Master’s Thesis
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Acknowledgments

The Nord-Trøndelag Health Study (Helseundersøkelsen i Nord-Trøndelag, HUNT) is the result of collaboration between the HUNT Research Centre, Faculty of Medicine, Norwegian University of Science and Technology (NTNU), the Norwegian Institute of Public Health, and Nord-Trøndelag County Council. I thank the Board of HUNT for giving me permission to carry out this study.

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1.0 Abstract

**Background:** Previous studies have suggested that physically active behavior is associated with reduced symptoms of depression and anxiety. It is uncertain whether this relationship is affected by a third underlying factor. The aim of this study is to evaluate the association between physical activity (PA), symptoms of depression and anxiety, and personality traits.

**Methods:** During the period 2006–2008, the third phase of a population-based health survey (HUNT 3) was conducted in the county of Nord-Trøndelag in Norway. In total, 38,743 subjects aged 19 years or older completed the self-reported questionnaires on PA, mental health problems and personality in HUNT 3, of which 21,722 (56.1%) were women and 17,021 men (43.9%). The Hospital Anxiety and Depression Scale (HADS) was used to detect case-level symptoms of depression and anxiety, while the Eysenck Personality Questionnaire (EPQ) was used to measure the stable and consistent personality dimensions extroversion and neuroticism. Analysis focused on the odds of HADS-defined depression and anxiety comparing different levels of PA. Also, the linear trend between PA and personality scores was assessed.

**Results:** The prevalence of depression and anxiety scores above 8 was 9.5% and 14.1% respectively. Distribution of HADS-defined anxiety, scored extroversion, and scored neuroticism was higher among women compared with men, while HADS-defined depression had a higher distribution among men. The results from this cross-sectional study suggest that moderately physically active individuals have significantly lower odds of symptoms of depression and anxiety compared with less physically active individuals \( p < 0.05 \). High PA had no further effect on mental health. A lower risk of HADS-defined anxiety was found among physically active women in comparison with physically active men. In the association with personality, lower levels of PA had a significant negative linear trend than high PA in relation to extroversion score \( p < 0.01 \) and a significant positive linear trend with lower PA than high PA in relation to neuroticism score \( p < 0.01 \). Small and consistent effects of the association between PA and scored extroversion and neuroticism were observed among both women and men.

**Conclusion:** Subjects reporting regular PA were less likely to report symptoms of depression, but only physically active women were associated with lower symptoms of anxiety. Personality may be an important underlying factor in explaining this association, but other possible mechanisms might be more elucidating.
2.0 Introduction

Mental health problems are characterized by frequent negative symptoms or ailments which significantly affect an individual’s ability to function on a daily basis (Biddle & Mutrie, 2008). The present study focuses on the two most common mental health problems in Norway, namely depression and anxiety (Norwegian Institute of Public Health, 2009). Depression is defined as “the emotion of sadness, and in addition feelings of sorrow, hopelessness, gloom, lack of energy, and anhedonia” (Bjelland, 2004, p. 13). Anxiety is defined as “the emotion of fear involving feelings of tension, worry, apprehension, and dread for something considered dangerous in the future” (Bjelland, 2004, p. 13). The World Health Organization (WHO) predicts that by 2020 depression will be the second most common cause of mortality and the most incapacitating problem in the world (Murray & Lopez, 1997). The consequences of anxiety disorders may be similar to those related to depression (Myers et al., 1984; Norwegian Institute of Public Health, 2009). Further, the consequences of depression and anxiety may vary in degree of severity due to variations in intensity and duration of the symptomatic conditions (Biddle & Mutrie, 2008). During the last 20 years, studies of depression and anxiety in epidemiological health surveys have received greater focus due to the large numbers of people suffering from these disorders in modern society (Biddle & Mutrie, 2008). Possible links have been found between somatic health condition and the risk of mental health problems, but many underlying factors may affect this association (Pettit, Grover, & Lewinsohn, 2007).

2.1 Prevalence of depression and anxiety

Approximately one-third of the adult Norwegian population has suffered from a mental health problem at some point in time (Norwegian Institute of Public Health, 2011). A study of a Norwegian urban population (N = 2066) found a 12-month prevalence of 7.3% with major depression, but only the occurrence of separate anxiety disorders were reported (Kringlen, Torgersen, & Cramer, 2001). In comparison, the 12-month prevalence of depression and anxiety has been reported to be 9.5% and 17.2% respectively in a US population (Kessler et al., 2005) and 4.5% and 12.7% in a cross-European population (Alonso et al., 2004). Differences in sample characteristics, diagnostic tools, and measurement techniques may explain the variations in prevalence between the studies (Norwegian Institute of Public Health, 2009).
2.2 Physical activity and mental health problems

In this study PA is defined as “all bodily movement procedures by muscle action that increases energy expenditure” (McArdle, Katch, & Katch, 1996, p. 632). A physically active lifestyle has been found to be an effective way of improving fitness and overall health (Haskell et al., 2007). Conversely, the absence of a physically active lifestyle can adversely affect health and well-being, increasing the risk of somatic health problems such as cardiovascular diseases, hypertension, diabetes mellitus, osteoporosis, and some types of cancer (US Department of Health, 1997). In addition, regular PA is known to have a positive impact on mental health (Biddle & Mutrie, 2008; Ströhle, 2009). A number of meta-analyses of intervention studies of the effect of exercise training have revealed that exercise may have a significant moderate to high anti-depressive effect (Byrne & Byrne, 1993; Lawlor & Hopker, 2001; McDonald & Hodgdon, 1991; North, McCullagh, & Tran, 1990) and a small to moderate anxiolytic effect (Byrne & Byrne, 1993; Long & van Stavel, 1995; McDonald & Hodgdon, 1991; North et al., 1990; Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991).

However, extending the results from intervention studies to “the real world” could lead to divergent outcomes, and therefore observational designs may be preferable when studying associations in populations as a whole (Rothman, 2002). Previous results from large-scale observational studies show that leisure-time PA has a small to moderate effect in reducing the risk of depression (Augestad, Slettemoen, & Flanders, 2008; De Moor, Beem, Stubbe, Boomsma, & De Geus, 2006; De Moor, Boomsma, Stubbe, Willemsen, & de Geus, 2008; Goodwin, 2003; Mutrie & Hannah, 2007; Harvey, Hotopf, Overland, & Mykletun, 2010; Hassmén, Koivula, & Uutela, 2000; Mikkelsen et al., 2010; Teychenne, Ball, & Salmon, 2008; Thorsen et al., 2005), but results relating to anxiety are equivocal (De Moor et al., 2006; De Moor et al., 2008; Goodwin, 2003; Mutrie & Hannah, 2007; Harvey et al., 2010; Stephens, 1988; Thorsen et al., 2005). For instance, following a cross-sectional study involving a large sample (N = 20,207) of the Norwegian population, Thorsen et al. (2005) reported that reduced symptoms of depression and anxiety were associated with increased levels of PA. However, the association between PA and symptoms of anxiety did not persist after the adjusted analyses. Few observational studies have focused on determining whether PA may have an anxiety-reducing effect and inconsistency in their results makes it doubtful whether there is a relationship between PA and anxiety (Biddle & Mutrie, 2008).
2.3 Physical activity and personality

A few lifestyle related factors have consistently been found to be associated with depression and anxiety; smoking, education, social class, social support, marital status, alcohol (Folkehelseinstituttet, 2009), and BMI (Scott et al., 2007). Also, heritable genetic factors are claimed to affect both exercise behavior (Stubbe et al., 2006) and depressive and anxious symptoms (Boomsma et al., 2000), and growing evidence has been found that during the course of life people have enduring and consistent biological dispositions which influence their “interactions with, and adaptations to, the intrapsychic, physical, and social environments” (Buss & Larsen, 2005, p. 4). In recent years there has been a progress towards a higher-order trait classification which includes basic personality traits ranging from two to seven traits (Buss & Larsen, 2005). The Eysenck Personality Questionnaire (EPQ) is one of the most established models in exercise research and has operated with two basic personality traits: extroversion (i.e., a tendency to be impulsive, sociable, assertive, energetic, seek excitement, and experience positive affect) and neuroticism (i.e., a tendency to be emotionally unstable, angry, hostile, anxious, self-conscious, and vulnerable) (Eysenck & Eysenck, 1975).

A health-behavior model could be used to explain the general associations between personality traits and somatic and mental health, whereby personality affects individual perceptions of the benefits of and barriers to performing a particular health behavior in response to the perceived risk of a particular negative health outcome (Janz & Becker, 1984). It is well known that neuroticism and extroversion are highly correlated with depression and anxiety (Klein, Kotov, & Bufferd, 2011; Middeldorp et al., 2005; Tambs, 2009), but might also directly or indirectly influence health maintenance behaviors such as PA participation through several pathways (Pettit et al., 2007). A meta-analytic review of studies published between 1969 and 2006 revealed that physically active individuals scored higher on extroversion and lower on neuroticism than physically inactive individuals (Rhodes & Smith, 2006), but the weakness of the association raises questions regarding the effect of personality on PA participation.

Few studies have investigated how personality influences the relationship between PA and mental health problems in the general population (De Moor, et al., 2006; De Moor, et al., 2008; Emery, Huppert, & Schein, 1996; Hassmén, et al., 2000). To my knowledge, only one population based observational study has investigated the association between PA and personality with both depression and anxiety. In a large (n = 19,288) Netherlands twin population aged 18-50 years, De Moor et al. (2006) detected that regular exercisers scored lower on symptoms of mental health problems, lower on neuroticism and higher on extroversion than irregular
exercisers. The association was significant irrespective of gender and age. Detailed information of intensity, duration and frequency is needed for establishing a reliable pattern of PA with mental health problems and personality. Furthermore, since former studies have not identified any gender differences in the relationship between PA, mental health problems, and personality, a stratified analysis by gender in relation with detailed self-reported information on PA may play an important role in discovering those differences.

2.4 The aims of the study

The purpose of this study is to investigate the cross-sectional association between leisure-time PA, mental health, and personality in a population-based observational survey in Norway (HUNT 3). The study focuses on the following questions:

1) Is there a cross-sectional association between physical activity and scores on mental health (HADS) among women and men?

2) Is there a cross-sectional association between physical activity and scores on the Eysenck Personality Questionnaire (EPQ) among women and men?
3.0 Materials and methods

Data were collected from The Health Survey in Nord-Trøndelag (Helseundersøkelsen i Nord-Trøndelag, HUNT), a population-based observational health survey in Norway. For the present cross-sectional study, the occurrence of leisure-time PA, personality, depression, and anxiety were all reported using questionnaires developed for HUNT 3.

3.1 Design

During the period 2006–2008, all adults in the county of Nord-Trøndelag in Norway aged 19 years or older received a posted letter with an invitation to participate in a health survey (HUNT 3). The letter included a comprehensive structured questionnaire designed to assess demographics, health, lifestyle, and personality. From the 94,149 eligible individuals invited to participate in HUNT 3, 50,839 (54.0%) returned the questionnaire. Of those, 27,779 (58.5%) were women and 23,060 (49.3%) men. During the medical examination participants were handed a second, more detailed, questionnaire. Participants either filled in and delivered the questionnaire at the facility or completed it at home and returned it by mail.

3.2 Sample

All 50,839 participants in HUNT 3 aged 19 years or older were included in the study. Of those, 12,096 (23.8%) subjects were excluded from the analysis because of missing information relating to PA, HADS, or EPQ (Figure 1). For subjects who reported 0 frequency but had missing answers on duration and intensity, a 0 score on duration and intensity was assigned. The sample then consisted of 38,743 subjects, 21,722 women (56.1%) and 17,021 men (43.9%). The mean age of the sample was 51.2 years for women and 55.1 years for men.
The Regional Committee for Ethics in Medical Research (Norway) approved the HUNT study. All participants gave their informed consent to participate in the study.

3.3 Measurements

3.3.1 Physical activity

The participants reported their average weekly frequency of leisure-time PA during the last 12 months prior to participation in HUNT 3 by selecting one of five response choices (0, < 1, 1, 2–3, > 4 times). Those who reported exercising once per week or more were also asked about the average duration (four categories: < 15, 15–30, 30–60, > 60 min.) and average intensity of activity (three categories: light, moderate, vigorous). The questions regarding PA from the HUNT survey have been validated with a good internal consistency in men (Kurtze, Rangul, & Hustvedt, 2008).
Among subjects who reported frequency, duration, and intensity, a summary index of PA was calculated using the following method. The frequency scale was recoded to indicate approximate times per week (0, 0.5, 1, 2.5, 5), the duration scale was estimated by approximate hours per session of PA (0, 0.12, 0.38, 0.75, 1.5), and the intensity scale was scored as in the questionnaire (1 for light, 2 for moderate, and 3 for vigorous). Furthermore, the PA index was divided into three equal categories indicating light, moderate and high PA based upon the 33rd and 66th percentiles of the score. This categorization above was performed separately among women and men.

3.3.2 Hospital Anxiety and Depression Scale (HADS)

The HADS, which consists of two subscales (total 14 items), is designed for use in health surveys. The aim is to estimate the occurrence of mental health problems in populations, and therefore symptoms of severe psychopathology are not included. The two subscales consists of seven items for depression (HADS-D) and seven items for anxiety (HADS-A) (Zigmond & Snaith, 1983), but valid HADS subscale scores were calculated for those having completed at least five of seven items. A 4-point Likert scale was used on each question, from 0 (not present) to 3 (maximally present), formulated in a readable language. This was found satisfactory when the questions was translated in Norwegian (Mykletun, Stordal, & Dahl, 2001). The classification of scores on the HADS-D and HADS-A subscales is as follows: 0–7 = normal, 8–10 = mild disorder, 11–14 = moderate disorder, and 15–21 = severe disorder. In the present analysis, a cut-off point of 8 was used on each subscale (Zigmond & Snaith, 1983). Validation studies indicate high sensitivity and specificity of a score > 8 for both HADS-D and HADS-A (Bjelland, Dahl, Haug, & Neckelmann, 2002; Herrmann, 1997).

3.3.3 Eysenck Personality Questionnaire (EPQ)

The EPQ was developed from a factor analysis of the Maudsley Personality Inventory (MPI) by Eysenck & Eysenck (1975), and is widely used for examining personality traits (Buss & Larsen, 2005). The short-form version of the EPQ consists of 12 items for aspects of extroversion-introversion and neuroticism-emotional stability. A modified version, the Eysenck Personality Questionnaire Revised-Abbreviated (EPQR-A), was used
in HUNT 3 with 6 items on the extroversion scale and a further 6 items on the neuroticism scale. The selection of combinations of items in the short-form version was based on analysis of the best predicted score from full-scale data material with a high validity for both extroversion and for neuroticism (Francis, Brown, & Philipchalk, 1992). The items on the scale are dichotomous, with a yes (1)/no (0) response to each item and the traits are sum score calculations ranging from 0 to 6 on each scale. In the present study, a higher score indicates higher distribution of the trait (Eysenck & Eysenck, 1975).

3.3.4 Confounding variables

Confounders were integrated in the main analysis as covariates if their estimated univariate linear relationship with either the HADS subscales or EPQ subscales had a significance level of p < 0.20. The following variables were identified as potential confounders: age (categorized as 19–40, 41–60, and > 60 years), body mass index (< 18.5, 18.5–24.9, 25–29.9, 30–34.9, > 35 kg/m² on the WHO scale (WHO, 2000)), marital status (unmarried, married, widowed, previously married), living with other people (yes, no), occupational activity level (mostly passive, frequently walking, frequently lifting and walking, heavy manual labor), current smoking status (yes, former, no), frequency of alcohol consumption during the 12 months prior to the study (teetotaler, < 1 time per month, 1 times per month, 2–3 times per month, 1 time per week, 2–3 times per week, 4–7 times per week), mental health problems in the family (yes, no, uncertain), and chronic somatic diseases (yes, no), including diabetes, angina pectoris, myocardial infarction, asthma, diabetes, epilepsy, arthritis, osteoporosis, stroke, pulmonary arterial obstructive disease, sarcoidosis, Bechterew’s disease, and fibromyalgia. An additional analysis was performed to assess the potential interaction between age or BMI and other confounders.

3.5 Statistical analyses

Statistical analyses were carried out using SPSS Version 11. Descriptive statistical analysis included total number (N) of participants, means, standard deviations (SDs), and percentages of categorical baseline characteristics of the sample in relation to HADS-D or HADS-A scores above 8. The mean HADS-D and HADS-A scores across the subgroups of baseline characteristics were examined using one-way ANOVA.
analysis. Adjusted logistic regression was used to study the association between the odds of being either depressed or anxious among each PA category in comparison with a reference category. Parameter estimates were obtained by maximum likelihood and odds ratios (ORs) generated for HADS-defined depression and HADS-defined anxiety with corresponding 95% confidence intervals (CIs).

With personality, the mean score of the distribution of EPQ-extroversion and EPQ-neuroticism according to gender were tested with independent t-tests. Analyses of the association between PA and personality were carried out by performing a general linear model (GLM) analysis was conducted to study the adjusted mean score and linear trend of EPQ-extroversion and EPQ-neuroticism across PA categories and in comparison with a reference category. Parameter estimates were achieved by beta (B) generated for extroversion and neuroticism scores with corresponding 95% CIs.

In all of the above-mentioned analyses, adjusted models were run separately for each of the PA variables (PA index, frequency, duration, and intensity) in relation to HADS and EPQ. Furthermore, all adjusted analyses were either simple (adjusting for age only) or multivariate, where the variables in the multivariate model were selected by the univariate relationship between either HADS or EPQ and possible confounding variables having a p < 0.2 as described previously. In further analyses, probabilities below p = 0.05 were regarded as statistically significant. However, a statistical significance level of p = 0.01 was chosen in the GLM analysis for trend.
4.0 Results

4.1 Physical activity

As shown in the lower half of Table 1, a total of 7201 (18.5%) individuals in the sample were physically active almost every day on a weekly basis. PA was highly related to age, and of those aged < 60 years, 7033 (30.2%) were assigned a low PA score, 10,308 (44.3%) were assigned a moderate PA score, and 5918 (25.4%) were assigned a high PA score. In comparison, of those aged > 60 years, 4655 (35.5%) were assigned a low PA score, 5019 (38.3%) were assigned a moderate PA score, and 3425 (26.1%) were assigned a high PA score.

4.2 HADS-D score with gender

Table 1 lists the numbers and percentages of levels of baseline characteristics, including PA and personality and their mean scores on the depression scale among women and men. A total of 2531 (9.5%) individuals scored > 8 on the HADS-D scale. Mean HADS-D score was 3.15 among women and 3.55 among men. Altogether, 1910 (8.8%) women and 1774 (10.4%) men scored > 8 on the HADS-D scale. When the classification of the HADS-D subscale (Zigmond & Snaith, 1983) was applied, 1454 (6.7%) women and 1359 (8.0%) men had “mild depression”, 361 (1.7%) women and 333 (2.0%) men had “moderate depression”, and 95 (0.4%) women and 82 (0.5%) men had “severe depression”.
Table 1 Baseline characteristics and scored depression in the HUNT 3 study population.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Women (N = 21,722)</th>
<th></th>
<th></th>
<th>Men (N = 17,021)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HADS-D</td>
<td>% (&gt;8)†</td>
<td>HADS-D</td>
<td>% (&gt;8)†</td>
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<tr>
<td></td>
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<td>7.8</td>
<td>11058</td>
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<td>12.1</td>
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<td>11.6</td>
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<td>&lt;18.5</td>
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<tr>
<td>Teetotaler</td>
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Notes: PA = physical activity; HADS-D = Hospital Anxiety and Depression Scale Depression subscale; BMI = body mass index; EPQ-E = Eysenck Personality Questionnaire subscale extroversion; EPQ-N = Eysenck Personality Questionnaire subscale neuroticism; ∥ = No drinking in the past 2 weeks, but not a teetotaler; + = Physical activity index: sum score of frequency, duration, and intensity; # = median extroversion score of 4.0; ^ = median neuroticism score of 1.0; † >8 = sum-score of 8 or higher of HADS-D; * = sig. p-values (< 0.05) indicate results of the Pearson's chi-square test.

### 4.3 HADS-A score with gender

Table 2 lists the numbers and percentages of levels of baseline characteristics, including PA and personality and their mean scores on the anxiety scale among women and men. In comparison with depression, a higher prevalence of anxiety was detected in the sample, with a total of 4089 (14.2%). The mean HADS-A score was 4.37 among women and 3.53 among men. When the classification of the HADS-A subscale (Zigmond & Snaith, 1983) was applied, 3776 (17.4%) women and 1742 (10.2%) men scored > 8 on the HADS-A scale. Among those, 2435 (11.2%) women and 1215 (7.1%) men had “mild anxiety”, 951 (4.4%) women and 384 (2.3%) men had “moderate anxiety”, and 390 (1.8%) women and 143 (0.8%) men had “severe anxiety”.

4.3 HADS-A score with gender
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</tbody>
</table>

Notes: PA = physical activity; HADS-A = Hospital Anxiety and Depression Scale Anxiety subscale; BMI = body mass index; EPQ-E = Eysenck Personality Questionnaire subscale extroversion; EPQ-N = Eysenck Personality Questionnaire subscale neuroticism; ¤ = No drinking in the past 2 weeks, but not a teetotaler; + = Physical activity index: sum score of frequency, duration, and intensity; # = median extroversion score of 4.0; ^= median neuroticism score of 1.0; † >8 = sum-score of 8 or higher of HADS-A; * = sig. p-values (< 0.05) indicate results of the Pearson’s chi-square test.

4.4 The association between physical activity, depression, and anxiety

According to the calculated index, moderate and high PA were associated with a significantly lower prevalence of HADS-defined depression and anxiety compared with low levels of PA among both women and men (p < 0.05). Symptoms of depression and anxiety showed moderate reduction with increased PA levels among women, while increased PA levels were associated with a moderate reduction in HADS-defined depression and a small reduction in HADS-defined anxiety among men (Figure 2). The associations noted above were consistent among frequency, duration, and intensity (Figure 3). The observed association obtained by logistic regression analysis was found to be somewhat similar among women after adjusting for the suspected confounding effects of age, body mass index, alcohol consumption, current smoking status, mental problems in
the family, and chronic somatic diseases (Figures 2 and 3). An exception was that high intensity reached insignificant levels with HADS-defined depression among women (Figure 3). Occupational activity level had a significant univariate linear relationship with HADS-defined anxiety only (p < 0.20) and not with depression. None of the 13 different interactions tested for, between PA variables and the covariates in the models predicting either depression or anxiety had significant p-values. Among men, the association of PA levels with HADS-defined depression was unaltered from the univariate analysis, but both moderate and high PA reached insignificant levels with HADS-defined anxiety in the adjusted analysis (p > 0.05) (Figure 2).

**Figure 2** Adjusted odds ratio from the logistic regression analysis of the association between HADS subscales and PA among women and men.

(PA = physical activity; CI = confidence interval; * = statistically significant p-value (< 0.05) from the logistic regression analysis; † = adjusted for age; ‡ = adjusted for age, BMI, alcohol consumption during last 12 months, current smoking status, chronic somatic diseases, mental health problems in the family, and marital status; PA index = calculated index of sum score of frequency, duration, and intensity).
Figure 3 Adjusted odds ratio from the logistic regression analysis of the association between HADS subscales and frequency, duration, and intensity of activity among women and men.

(PA = physical activity; CI = confidence interval; * = statistically significant p-value (< 0.05) from the logistic regression analysis; † = adjusted for age; ‡ = adjusted for age, BMI, alcohol consumption during last 12 months, current smoking status, mental health problems in the family, chronic somatic diseases, and marital status; PA index = calculated index of sum score from frequency, duration, and intensity).
4.5 Physical activity and personality

A t-test analysis revealed that women scored significantly higher than men on EPQ-extroversion (p = 0.001) and EPQ-neurotism (p = 0.001) (results not shown). There was a significant (p < 0.01) negative trend across lower PA index levels with EPQ-extroversion score and a statistically significant (p < 0.01) positive trend across lower PA index levels with EPQ-neuroticism score in comparison with high PA. This linear trend was similar after accounting for the possible confounding effects of age, alcohol consumption, smoking status, chronic somatic diseases, and mental problems in the family (Tables 3 and 4). None of the 8 different interactions tested for reached statistical significance (p > 0.20) in the relationship between PA variables and either EPQ-extroversion or EPQ-neuroticism. While lower EPQ-extroversion score had a significant negative trend with lower frequency and intensity of activity among both women and men (p < 0.01), lower duration of activity had a significant negative trend with scored EPQ-extroversion (p < 0.01) only among women (Table 3). EPQ-neuroticism score had a positive trend among individuals with lower frequency and duration of activity (p < 0.01). Although intensity of activity had a significant trend with EPQ-neuroticism score (p < 0.01), only light intensity of activity among women was significantly associated with a higher score on EPQ-neuroticism compared with those who practically exhausted themselves (p < 0.05) (Table 4).
Table 3 adjusted beta (β) from general linear model analysis for extroversion in relation to physical activity in women and men.

<table>
<thead>
<tr>
<th>Extroversion</th>
<th>Women (N = 21,722)</th>
<th>Men (N = 17,021)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted a</td>
<td>Adjusted +</td>
</tr>
<tr>
<td>PA Index+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-0.20</td>
<td>-0.22</td>
</tr>
<tr>
<td>Moderate</td>
<td>-0.11</td>
<td>-0.11</td>
</tr>
<tr>
<td>High</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>P for trend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of weekly PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1</td>
<td>-0.25</td>
<td>-0.28</td>
</tr>
<tr>
<td>1 time per week</td>
<td>-0.11</td>
<td>-0.14</td>
</tr>
<tr>
<td>2-3 times per week</td>
<td>-0.06</td>
<td>-0.07</td>
</tr>
<tr>
<td>Almost every day</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>P for trend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of weekly PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15 min.</td>
<td>-0.11</td>
<td>-0.09</td>
</tr>
<tr>
<td>15-30 min.</td>
<td>-0.19</td>
<td>-0.18</td>
</tr>
<tr>
<td>30 min - 1 hr</td>
<td>-0.09</td>
<td>-0.08</td>
</tr>
<tr>
<td>&gt;1 hr</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>P for trend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity of PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take it easy</td>
<td>-0.28</td>
<td>-0.29</td>
</tr>
<tr>
<td>Push until I lose my breath</td>
<td>-0.16</td>
<td>-0.17</td>
</tr>
<tr>
<td>Practically exhaust myself</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>P for trend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: PA = physical activity; CI = confidence interval; $R^2$ = coefficient of determination; * = p-value (< 0.01) of the general linear model analysis with PA variables as covariates; a = adjusted for age; b = adjusted for age, alcohol consumption, current smoking status, chronic somatic diseases, and living with others; + = Physical activity index: sum score of frequency, duration, and intensity.
Table 4 adjusted beta (β) from general linear model analysis for neuroticism in relation to physical activity in women and men.

<table>
<thead>
<tr>
<th>PA Index+</th>
<th>Neuroticism</th>
<th></th>
<th></th>
<th>Neuroticism</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women (N = 21,722)</td>
<td>Men (N =17,021)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>Adjusted α</td>
<td>Adjusted#</td>
<td>CI 95%</td>
<td>Adjusted a</td>
<td>Adjusted#</td>
<td>CI 95%</td>
</tr>
<tr>
<td>Low</td>
<td>0.40</td>
<td>0.30</td>
<td>0.23 to 0.39</td>
<td>0.21</td>
<td>0.17</td>
<td>0.11 to 0.24</td>
</tr>
<tr>
<td>Moderate</td>
<td>0.06</td>
<td>0.05</td>
<td>-0.01 to 0.10</td>
<td>-0.00</td>
<td>0.01</td>
<td>-0.05 to 0.07</td>
</tr>
<tr>
<td>High</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
</tr>
<tr>
<td>P for trend</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>R²</td>
<td>0.070</td>
<td>0.065</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Frequency of weekly PA</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>1 time per week</td>
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<td>0.14</td>
<td>0.06 to 0.21</td>
<td>-0.01</td>
<td>0.03</td>
<td>-0.05 to 0.11</td>
</tr>
<tr>
<td>2-3 times per week</td>
<td>-0.03</td>
<td>-0.02</td>
<td>-0.09 to 0.04</td>
<td>-0.05</td>
<td>-0.01</td>
<td>-0.08 to 0.06</td>
</tr>
<tr>
<td>Almost every day</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
</tr>
<tr>
<td>P for trend</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>R²</td>
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<td>0.066</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Duration of weekly PA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 15 min</td>
<td>0.80</td>
<td>0.59</td>
<td>0.44 to 0.74</td>
<td>0.52</td>
<td>0.44</td>
<td>0.32 to 0.56</td>
</tr>
<tr>
<td>15-30 min</td>
<td>0.31</td>
<td>0.21</td>
<td>0.12 to 0.29</td>
<td>0.30</td>
<td>0.24</td>
<td>0.16 to 0.32</td>
</tr>
<tr>
<td>30 min - 1 hr</td>
<td>0.10</td>
<td>0.09</td>
<td>0.02 to 0.15</td>
<td>0.06</td>
<td>0.06</td>
<td>-0.00 to 0.12</td>
</tr>
<tr>
<td>&gt; 1 hr</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
</tr>
<tr>
<td>P for trend</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>R²</td>
<td>0.071</td>
<td>0.069</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Intensity of PA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take it easy</td>
<td>0.33</td>
<td>0.26</td>
<td>0.07 to 0.44</td>
<td>0.21</td>
<td>0.11</td>
<td>-0.02 to 0.23</td>
</tr>
<tr>
<td>Push until I lose my breath</td>
<td>0.01</td>
<td>0.01</td>
<td>-0.17 to 0.19</td>
<td>0.02</td>
<td>-0.01</td>
<td>-0.13 to 0.11</td>
</tr>
<tr>
<td>Practically exhaust my self</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
<td>Ref</td>
<td>Ref</td>
<td>*</td>
</tr>
<tr>
<td>P for trend</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>R²</td>
<td>0.070</td>
<td>0.065</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Notes: PA = physical activity; CI = confidence interval; R² = coefficient of determination; * = p-value (< 0.01) of the general linear model analysis with PA run as covariate; a = adjusted for age; b = adjusted for age, alcohol consumption, current smoking status, chronic somatic diseases, and living with others; + = Physical activity index: sum score of frequency, duration, and intensity.
5.0 Discussion

The purpose of the study was to examine the cross-sectional association between physical activity (PA), mental health, and personality in a Norwegian health survey. The primary findings are that individuals with higher levels of leisure-time PA had fewer symptoms of depression and anxiety measured by HADS, and scored higher on extroversion and lower on neuroticism in comparison with individuals with less leisure-time PA. Compared to low PA levels, moderate levels were related to lower scores of mental health problems after adjusting for possible confounders. Higher amounts of PA were not related to further reductions in HADS scores. Furthermore, lower risk of HADS-defined anxiety was observed among physically active women compared with physically active men. The Eysenck Personality score was weakly, but consistently, related to levels of PA among both women and men in the multivariate models.

The prevalence of depression (9.5%) score from the present study was somewhat higher compared to that of a previous clinical Norwegian study (7.3%; Kringlen et al., 2001). The present study found a lower prevalence of HADS-defined anxiety (14.2%) compared with a US population (18.1%; Kessler et al., 2005), and this is in accordance with an earlier report which claims that the Norwegian population has a lower occurrence of anxiety in comparison with other westernized populations (Norwegian Institute of Public Health, 2009). The scored HADS was diverse between genders, where women scored lower on HADS-defined depression and higher on HADS-defined anxiety than men. The observation of lower HADS-defined depression among women was unexpected since earlier studies have reported a higher rate of depressive symptoms (Kessler et al., 2005; Kringlen et al., 2001) among women compared with men. However, comparable with the results from the present study, an earlier study found a somewhat similar occurrence of HADS-defined depression in the HUNT 2 population (Augestad et al., 2008). The HADS questionnaire lacks the items which cover the somatic symptoms of depression (Bjelland et al., 2002). Therefore, an underrepresentation of HADS-defined depression among women may be present, because women are reported to have a higher occurrence of somatic symptoms with depression than men (Silverstein, 1999). Despite the shortcoming, HADS is a valid screening tool to cover the core aspects of depression according to the ICD-10 classification (Stordahl et al., 2001). In the relationship
between scored personality and gender, a higher mean extroversion and neuroticism score were observed among women than men. The result with scored extroversion diverged with the findings from a previous review investigating the interaction of scored EPQ with gender, where men scored higher in 30 of 37 included studies in comparison with women (Lynn & Martin, 1997).

Approximately 18% of the participants of this study were physically active for 30 minutes or more almost every day. Although women had higher frequency of PA than men, physically active men were found to have slightly higher duration and intensity of activity. This finding is consistent with that of a previous study (Norwegian Directorate of Health, 2009). Regular PA is well recognized as a health-related behavior that is important for both physical health (Haskell et al., 2007) and mental health (Biddle & Mutrie, 2008; Ströhle, 2009).

Observational studies with wide age range have investigated the association between PA and symptoms of both depression and anxiety in the general population (Asztalos et al., 2010; De Moor et al., 2006; De Moor et al., 2008; Goodwin, 2003; Harvey et al., 2010; Mutrie, 2007; Stephens, 1988; Thorsen, et al., 2005). The findings of the present study were comparable to those of a cross-sectional study by Stephens (1988), where lower symptoms of both depression and anxiety were associated with moderate and high PA, compared with low PA in the adjusted analysis.

Teychenne, Ball & Simon (2008) claimed in their meta-analysis that too few systematic observational studies have recommended a general amount of leisure time PA in prevention of depression in the general population (Teychenne, Ball, & Salmon, 2008). This also applies to anxiety (Biddle & Mutrie, 2008). The present study indicates that PA does have mental benefits, but a dose-response relationship was not observed between HADS-defined depression and anxiety with levels of PA. Only minor changes in risk of depression were found with higher amounts of activity in comparison with moderate PA. Hence, the results from present study support the conclusion by Hassmén et al. (2000) that daily vigorous PA may not be more favorable for mental health than moderate PA because it might be associated with athletic performance or hectic schedule with everyday job and family. Thereby, daily vigorous exercise might lead to burnout, which in turn would mimic symptoms of mental health problems. It follows that specific recommendations of PA levels for mental health seem to be more complex in comparison with the recommendation of PA levels for physical health (Ströhle, 2009).
The context in which activity is performed may affect any associations with the mental health. Subjects reporting “heavy manual labor” had higher reported symptoms of depression and anxiety in comparison with lower levels of occupational activity, which is contrast with the observed association between leisure time PA and mental health problems. Previous studies have found leisure-time PA more beneficial than work-related PA for reducing the risk of scored depression (Mutrie & Hannah, 2007; Harvey et al., 2010; Mikkelsen et al., 2010) and anxiety (Harvey et al., 2010), even in cases where the context provided similar frequency, duration, and intensity. Leisure-time activities could support a more meaningful life for individuals through preventing negative behavior (i.e., coping with stress) and promoting positive behavior (i.e., life satisfaction) (Iwasaki, 2008).

Mental health benefits of PA, defined as lower scores of depression and anxiety, did not apply equally between genders. To my knowledge, the present study is the first observational study using HADS as assessment tool that has found a gender effect between PA levels and symptoms of anxiety (Harvey et al., 2010; Thorsen et al., 2005; Mutrie, 2007), where physically active women were observed to have a lower risk of HADS-defined anxiety than physically active men. The dose of PA, were characterized differently with symptoms of depression among women and men, seems to be an important factor in the association with mental health problems between women and men. Higher frequency and duration of activity were associated with lower risk of depression and anxiety among women than men. However, the importance of intensity of activity between women and men with lower symptoms of mental health problems is in relation with the results from a previous cross sectional study (Asztalos et al, 2010), where moderate levels of intensity seems to be most important among women, while high levels of intensity seems to be most important among men. This association with intensity is in relation with the results from a previous cross sectional study (Asztalos et al., 2010). This association with gender is independent of the effects of differences in amount of PA, prevalence of HADS-defined depression and anxiety, or scored personality. A possible explanation, namely that women experience greater mental health benefits from performing health-related activities (i.e., PA) in comparison with men, has been claimed by Stephens (1986). Potential biological, somatic, psychological, and social mechanisms could elucidate this gender effect of levels of PA on the mental health (Asztalos et al., 2010; Chipperfield, Newall, Chuchmach, Swift, & Haynes, 2008; Haug, Mykletun, & Dahl, 2004; Seeman, 1997).
A third underlying variable might possibly be related with both PA and mental health and could perhaps clarify the observed relationship between levels of PA and HADS-defined depression and anxiety. Many confounding variables with scored mental health problems were identified and adjusted for in the analyses, and thus should not confound the observed association between PA and mental health in this study. Personality is suggested to be one of many demographic, sociological, and psychological determinants affecting the perception of benefits of and barriers to health-related behaviors in relation to the alleged risk of disease (Janz & Becker, 1984). The present study observed that scored more extroverted and less neurotic were associated with higher levels of PA, which supports previous studies that investigated the association between scored personality with levels of PA (De Moor et al., 2006; Rhodes & Smith, 2006).

Although this study can not state the relationship between personality and mental health problems, other previous performed studies have clearly found an association between scored low extroversion and high neuroticism with higher risk of depression and anxiety (Klein et al., 2011; Middeldorp et al., 2005; Tambs, 2009). Extroverted individuals are claimed to have less arousal than introverted individuals (Eysenck & Eysenck, 1975), and could consult PA because of challenging activities and possibility to socialize with others (Rhodes & Smith, 2006). Neurotic individuals, on the other hand, are claimed to be emotionally unstable to life events because they perceive them as threatening than individuals who scores low on neuroticism (Eysenck & Eysenck, 1975). Therefore, high scored neurotic individuals, in relation with the health behavior model, might withdraw from participating in PA or perform low levels of PA because they might perceive fewer barriers in relation with their level of arousal than high level PA (Rhodes & Smith, 2006).

Although personality is assumed to be more closely associated with levels of PA compared with environmental factors (Duncan, Spence, & Mummery, 2005), the observed modest effect of personality characteristics with levels of PA in the present study questions the importance of personality in this association. An explanation might be that personality is a biological construct that might set the stage for health behaviors such as PA, either directly or indirectly by affecting other mechanisms such as social cognition, mental health disorders, and somatic diseases (Pettit et al., 2007). Alternatively, extroversion and neuroticism are independent traits on a continuum (Eysenck & Eysenck, 1975), and therefore it is possible to score low or high of both traits (i.e., high scored extroversion and high neuroticism) which might present
diverse behavioral outcomes. Lastly, both positive and negative behavioral health outcomes might be caused of the same trait. For example, extroverted individuals are associated with health-related behaviors like PA (Rhodes & Smith, 2006), but also suggested to be associated with risky behaviors like smoking, high alcohol consumption and risky sexual behavior (Vollrath & Thorgersen, 2002).

5.1 Strengths and limitations of the study

The main strength of the present study is its population-based observational nature. This made it convenient for estimating the occurrence of PA participation, prevalence of mental health problems, and personality traits in the sample population. The wide age range made it possible to extend the result to young adulthood and elderly in the general population. Also, the large sample size made it possible to run a regression analysis controlling for possible confounding effects with a wide range of detailed self-reported variables.

The main limitation of the study is the cross-sectional design, which is only useful for the purpose of descriptive analysis (i.e., prevalence) of associations between factors. Therefore, no firm conclusion can be made regarding the causal structure of the variables which influence the relationship between PA, mental health and personality. Research with experimental design has found a causal association between increased PA and reduced mental health problems (Byrne & Byrne, 1993; McDonald & Hodgdon, 1991), it would be difficult to reach a firm conclusion that PA has the same effect of reducing the symptoms of mental health problems in all individuals in a naturalistic setting since there are several biasing factors, such as social surroundings, positive feedback by health professionals, and the expected therapeutic effect of a given program (Barbour, Edenfield, & Blumenthal, 2007). Longitudinal research is therefore needed. Two possible scenarios might arise with the function of personality in the relationship between PA and mental health: PA might be attractive to certain types of personality and over time prevent symptoms of mental health
problems developing; alternatively, personality might influence the development of mental health problems after a time, leading to a sedentary lifestyle.

This study is based upon self-reported data with satisfactory validity of the PA questionnaire (Kurtze et al., 2008), HADS (Bjelland et al., 2002) and EPQ (Francis et al., 1992). Since self-reported information of the variables above was assessed in this study in favor of direct objective measurements, misclassification or lack of reported information might have occurred and led to incorrect categorization of the included subjects in several ways; First, although the PA questionnaire from present study was more comprehensive than used in previous studies (De Moor et al., 2006; Hassmén et al., 2000), some subjects might exceed the amount of PA in relation with the choices of categories from the PA variables. Also, the PA index had low thresholds of the calculated PA categories in contrast to a previous study (Augestad et al., 2008) because of the aim of equal quantity of subjects between categories of the PA index among women and men. Secondly, the HADS questionnaire is claimed to be a satisfactory screening tool in identifying symptoms of sub-clinical mental health problems (Herrmann, 1997), but do not measure symptoms of severe psychopathology or have questions regarding the whole symptomatic description of depression and anxiety (Bjelland, 2004). This could affect the identification of subjects with depression and anxiety. Lastly, The EPQ is one of the most used trait questionnaires in exercise research now a day (Buss & Larsen, 2005). However, it is questioned if this gender difference of EPQ is a result of the personality or measuring the social manifestation between men and women (Forrest, Lewis, Shevlin, 1999). Nevertheless, self-reported questionnaires are low cost and less time consuming in measuring a phenomenon in large populations in comparison with objective measurements (Rotman, 2002).

A third limitation might be the HUNT 3 population. The HUNT 2 population was claimed to be stable, homogenous, and representative of the Norwegian population as a whole (Holmen et al., 2003), but no comprehensive studies of the HUNT 3 population have been carried out. The rural area of the HUNT 3 population might significantly differ in the frequency of PA participation (Norwegian Directorate of Health, 2004) and prevalence of mental health problems (Norwegian Institute of Public Health, 2009) in comparison with urban areas. Further, there may be variation in levels of PA on a weekly basis according to the season. Even though winters in Norway are colder in comparison with other countries, consistent levels of PA are observed throughout the season due to the popularity of winter sports and
leisure-time activities (Holmen et al., 2003). Also, a lower participation rate in HUNT 3 compared with HUNT 2. The present study found that the participation rate in the study was lowest among women and men in the youngest age group, which was also evident in the HUNT 2 study (Holmen et al., 2003). Approximately 20% of the sample did not respond to the PA, HADS, or EPQ questionnaires. A possible explanation might be that many individuals have only responded to the first questionnaire and did not respond on the follow-up questionnaire which included the questions of mental health problems and personality. Alternatively, high numbers of elderly participants above aged 60 years (37.0%) were participating, and Bjelland (2004) suggested that the reduced cognitive capacity among elderly individuals could explain significant amounts of missing information from the HUNT 2 study. The consequences of low participation rate and missing information may have led to an incorrect distribution of PA, mental health problems, and scored personality among gender and age.

Lastly, residual confounding by incorrectly measured variables or confounding variables not included in the adjusted analysis might have affected the observed associations in both directions. For example, education is associated with poorer health status and lower PA participation (Krokstad & Westin, 2002). Education was not included in the multivariate models because the HUNT 3 study linked the variable to the Central Bureau of Statistics (SSB) rather than data collected in the survey.

5.2 Further research and practical implications

Mental health problems have serious consequences for the life situation of individuals and for society as a whole. Since regular PA is relatively inexpensive and has beneficial effects on physical and mental health with few side effects in comparison with medication, health practitioners should encourage and make arrangements for people to be regularly physically active and thus prevent inactivity. Although personality is weakly related to PA, the importance for initiatives and prescribing PA for public health purposes is still central.
Further research with longitudinal design is important in detecting causal relationships in a general population in stating the relationship between PA, mental health, and personality. Longitudinal and experimental studies are also need to center on the symptomatic development of mental health problems in comparison with mental diseases, due to the consequences for individuals and society as a whole, and they should identify the risk and protective factors in the development of mental health problems. There is no doubt in that extroversion and neuroticism affects this development through different behavioral responses to environmental stimuli, and further research needs to clarify sub-components of these main personality traits or identifying other personality traits (i.e., conscientiousness) that predicts the mechanisms of participation in PA and the etiology of depression and anxiety. Also, extroversion and neuroticism could also be split into those who score high-high, high-low, low-high and low-low on the personality questionnaire. Furthermore, detailed and objective information on PA, depression, anxiety, and personality are important in verifying these underlying mechanisms. Measuring other PA (i.e., types of activity and physical fitness) and social-psychological variables (i.e., self-esteem and social environment) could be more informative in this association.

Research needs also to focus on gender differences between various age groups and the causal relationship between PA and mental health problems and personality. Women and men are biologically and behaviorally diverse, and might therefore perceive, report, or respond to environmental stimulation differently during their lifespan.

6.0 Conclusion

In my study, participants who were regularly voluntarily physically active were less likely to have symptoms of depression and anxiety. Physically active women had a lower risk of anxiety compared with physically active men. Personality is an underlying factor in the associations with levels of PA, but other possible variables may be more elucidating. The function of personality in the relationship with physical activity and mental health problems needs to be further examined.
7.0 References


**HUNT 3 Questionnaire 1**

**Health and daily life**

1. How is your health at the moment?
   - Poor
   - Not so good
   - Good
   - Very good

   Yes No

2. Do you suffer from long-term (at least 1 year) illness or injury of a physical or psychological nature that impairs your functioning in your daily life?

   If Yes, Would you describe your impairment as slight, moderate or severe?

   Slight Moderate Severe

   Motor ability impairment
   Vision impairment
   Hearing impairment
   Impairment due to physical illness
   Impairment due to mental health problems

3. Do you have physical pain now that has lasted more than 6 months?

   Yes No

4. How strong has your physical pain been during the last 4 weeks?

   No pain
   Very mild
   Mild
   Moderate
   Strong
   Very strong

5. To what extent has your physical health or emotional problems limited you in your usual socializing with family or friends during the last 4 weeks?

   Not at all
   Very little
   Somewhat
   Much
   Was not able to socialize

**Health services**

6. During the last 12 months, have you visited any of the following:

   Yes No

   General practitioner
   Another specialist outside the hospital
   Consultation w/ a doctor without being admitted to the psychiatric out-patient dept.
   to another hospital out-patient dept.
   Chiropractor
   Homeopath, acupuncturist, reflexologist, laying on of hands or other alternative treatment practitioner

7. Have you been admitted to hospital in the last 12 months?

   Yes No

**Illness and Injury**

8. Have you had any kind of attack of wheezing or breathlessness during the last 12 months?

   Yes No

9. Have you at any time during the last 5 years taken medicine for asthma, chronic bronchitis, emphysema or COPD?

   Yes No

10. Do you take or have you taken medication for high blood pressure?

    Yes No

11. Have you had or do you have any of the following:

    (Put an X on each line)

    Ex: (34 years old)

    Myocardial infarction (heart attack)
    Angina pectoris (chest pain)
    Heart failure
    Other heart disease
    Stroke/brain haemorrhage
    Kidney disease
    Asthma
    Chronic bronchitis, emphysema or COPD
    Diabetes
    Psoriasis
    Eczema on hands
    Cancer
    Epilepsy
    Arthritis (rheumatoid arthritis)
    Bechterew's disease
    Sarcoidosis
    Osteoporosis
    Fibromyalgia
    Degenerative joint disease (osteoarthritis)
    Mental health problems you sought help for

12. Has it ever been verified that you had high blood sugar (hyperglycaemia)?

    Yes No

    If Yes, in what situation was this discovered the first time?

    At a health examination
    While sick
    While pregnant
    Other
Injuries
13. Have you ever had:

- Hip fracture
- Fractured wrist/forearm
- Fracture/compressed dorsal vertebrae?
- Whiplash

If Yes, how old were you the first time?

Ex: (34 years old)

Illness in immediate family
14. Do your parents, siblings or children have, or have they had, the following illnesses? (one X per line)

- Stroke or brain haemorrhage before the age of 60
- Myocardial infarction (heart attack) before the age of 60
- Asthma
- Allergies/hay-fever/nasal allergies
- Chronic bronchitis, emphysema or COPD
- Cancer
- Mental health problems
- Osteoporosis
- Kidney disease (not kidney stone, urinary tract infection, urinary incontinence)
- Diabetes

15. Have your parents’ siblings, your cousins or either of your grandparents been diagnosed with diabetes (type 1 or type 2)?

Yes ☐ No ☐

How do you feel?
16. In the last two weeks, have you felt: (one X per line)

- Confident and calm
- Happy and optimistic
- Nervous and restless
- Troubled by anxiety
- Irritable
- Down/depressed
- Lonely

17. Has anyone at any time in your life tried to oppress, degrade or humiliate you over an extended period of time?

Yes ☐ No ☐

Smoking
18. Did any of the adults where you grew up smoke indoors?

Yes ☐ No ☐

19. Did your mother smoke when you were growing up?

Yes ☐ No ☐

20. Do you smoke? (Put an X in only one box)

- No, I have never smoked
- Yes, cigarettes occasionally (parties/vacation, not daily)
- Yes, cigarettes daily
- Yes, cigars/cigarillos/pipe occasionally
- Yes, cigars/cigarillos/pipe daily

If you never smoked, skip to question 22

21A. Answer this if you smoke daily now or previously smoked daily:

- How many cigarettes do/did you usually smoke daily?
- How old were you when you started smoking daily?
- If you previously smoked daily, how old were you when you quit smoking?

21B. Answer this if you smoke/previously smoked occasionally, but not daily:

- How many cigarettes do/did you usually smoke in a month?
- How old were you when you started smoking occasionally?
- If you previously smoked occasionally, how old were you when you quit?

22. Do you use, or have you used snuff?

- No, never
- Yes, occasionally
- Yes, but I quit
- Yes, daily

If you answered No, never, skip to question 23

23. If Yes, How old were you when you began using snuff?

24. How many portions snuff do/did you use a month?

25. If you use(d)/smoke(d) both cigarettes and snuff, which did you begin with first?

Snuff ☐ Cigarettes ☐ About the same time (within 3 months) ☐ Don’t remember ☐
Did you begin using snuff to try to quit or cut down on smoking?
No
Yes, to quit smoking
Yes, to cut down on smoking

Diet
23. How often do you normally eat these foods?
(one X on each line)

<table>
<thead>
<tr>
<th>Food Type</th>
<th>0-3 times a month</th>
<th>1-3 times a week</th>
<th>4-6 times a week</th>
<th>Once a day</th>
<th>Twice or more a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits, berries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate/candy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiled potatoes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pasta/rice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sausages/hamburgers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-fat fish on bread or for dinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

24. Do you take the following dietary supplements?
(One X for each supplement)

<table>
<thead>
<tr>
<th>Supplement</th>
<th>Yes, daily</th>
<th>Occasionally</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cod-liver oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omega-3 capsules</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamins and/or minerals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

25. How many glasses do you usually drink of the following?
(½ litre = 3 glasses (one X on each line))

<table>
<thead>
<tr>
<th>Drink Type</th>
<th>Seldom/never</th>
<th>1-6 gl. a week</th>
<th>1 gl. a day</th>
<th>2-3 gl. a day</th>
<th>4 gl or more a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water, Farris, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole milk (sweet/sour)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other milk (sweet/sour)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soda/juice w/sugar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soda/juice w/out sugar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juice or nectar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26. How many cups of coffee do you drink a day?
(write 0 if you do not drink coffee/tea daily)

<table>
<thead>
<tr>
<th>Drink Type</th>
<th>Number of cups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiled coffee</td>
<td></td>
</tr>
<tr>
<td>Other coffee</td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td></td>
</tr>
</tbody>
</table>

27. How many cups of coffee do you drink in the evening (after 6pm)?

<table>
<thead>
<tr>
<th>Number of cups</th>
</tr>
</thead>
</table>

Alcohol
28. About how often in the last 12 months did you drink alcohol? (do not include low-alcohol beer)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-7 times a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3 times a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About once a month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A few times a year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all last year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never drink alcohol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29. Did you drink alcohol during the last 4 weeks?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If Yes, Did you drink so much that you felt very intoxicated (drunk)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, 1–2 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, 3 times or more</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

30. How many glasses of beer, wine or spirits do you usually drink in the course of two weeks? (do not include low-alcohol beer, write 0 if you do not drink alcohol)

<table>
<thead>
<tr>
<th>Drink Type</th>
<th>Number of glasses</th>
</tr>
</thead>
</table>

Exercise
32. How often do you exercise? (on the average)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than once a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3 times a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nearly every day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

33. If you exercise as often as once or several times a week: How hard do you exercise? (average)

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I take it easy, I don't get out of breath or break a sweat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I push myself until I'm out of breath and break into a sweat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I practically exhaust myself</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

34. For how long do you exercise each time? (average)

<table>
<thead>
<tr>
<th>Duration</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 15 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 min.-1 hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-29 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 1 hour</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

35. Do you have at least 30 minutes of physical activity daily at work or in your leisure time?

| Yes | No |

36. About how many hours do you sit during a normal day? (include work hours and leisure time)

<table>
<thead>
<tr>
<th>Hours</th>
<th></th>
</tr>
</thead>
</table>
Employment
37. If you have had paid or unpaid employment, how would you describe your job? (One X only)
   Work that mostly involves sitting (ex: desk work, assembly worker)
   Work that requires much walking (ex: clerk, light industry worker, teacher)
   Work that requires much walking and lifting (ex: mail carrier, nurse, construction worker)
   Heavy physical labour (ex: forester, farmer, heavy construction worker)

Height/Weight
38. About how tall were you at age 18? cm Don’t remember
39. About how much did you weigh at age 18? kg Don’t remember

40. Are you satisfied with your weight now? Yes No, don’t weigh enough No, weigh too much

41. Have you tried to diet in the last 10 years? No Yes, a few times Yes, many times

42. Do you weigh at least 2 kg less than you did 1 year ago? Yes No

   If Yes, what is the reason for this?
   Dieting Illness/stress Don’t know

Serious events in the last 12 months
43. Has a member of your immediate family died? (Child, spouse/partner, sibling or parent)
   Yes No
44. Have you been in imminent mortal danger because of a serious accident, catastrophe, violent situation or war?
   Yes No
45. Has your relationship with your spouse or long-term partner ended?
   Yes No
46. If you answered Yes to one or more of the above questions (43, 44 or 45), how much have you reacted to this in the last 7 days?
   Not at all Moderate amount A little Very much

Childhood – When you were 0-18 years old
47. Who did you grow up with? Mother Other relatives Father Adoptive parents
   Stepmother/stepfather Foster parents

48. Did your parents leave each other, or get a divorce, when you were a child? No
   Yes, before I was 7 years old Yes, when I was 7-18 years old

49. Did either of your parents die when you were a child? No
   Yes, before I was 7 years old Yes, when I was 7-18 years old

50. Did you grow up with pets? No
   Yes, cat Yes, dog Yes, horse Yes, other animal

51. How much milk or yoghurt did you usually drink? Seldom/never 1-6 glasses pr. week 1 glass pr. day 2-3 glasses pr. day
   More than 3 glasses pr. day

52. Did you grow up on a farm with farm animals? Yes No

53. When you think about your childhood, would you describe it as:
   Very good Average Very difficult Good Difficult

In General
54. Thinking about your life at the moment, would you say that you by and large are satisfied with life, or are you mostly dissatisfied? (One X only)
   Very satisfied Satisfied Somewhat satisfied A bit of both Somewhat dissatisfied Dissatisfied Very dissatisfied
Dear HUNT participant

Thank you for taking part in this health study. We ask that you complete this questionnaire. Though some of the questions are similar to questions you have previously answered, it is important that you answer all the questions. The information will be used in research and preventative health care. Researchers will only have access to anonymous information; this means that the information cannot be traced back to the individual participants.

Please complete the questionnaire and send it in as soon as possible. Postage is paid.

Date completed

**Housing and Friends**

Who do you live with? (One or more Xs)

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>No one</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse/partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other people over 18 years old</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other people under 18 years old</td>
<td></td>
<td></td>
<td></td>
<td>Number of people under 18</td>
</tr>
</tbody>
</table>

Are there any pets in your home?

No | Yes, cat | Yes, dog | Yes, other animals w/ fur/birds |

Do you have friends that can help you when you need them?

Yes | No |

Do you have friends that you can speak to confidentially?

Yes | No |

**Your Surroundings (neighbourhood/group of farms)**

I feel a strong sense of community with the people who live here (One X)

<p>| | | | | |</p>
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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not sure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
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</table>

We do not trust each other here (One X)

<p>| | | | | |</p>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not sure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td></td>
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</tbody>
</table>

People like living here (One X)

<p>| | | | | |</p>
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<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat agree</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Not sure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
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</tbody>
</table>

**Physical Activity**

How much of your leisure time have you been physically active in the last year? Weekly average for the year. Commute counts as leisure time.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Low physical activity no sweat, not out of breath

<p>| | | | | |</p>
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<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigorous physical activity</td>
<td>sweat, out of breath</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How many hours in total are you in front of a computer screen? (Write 0 if you don’t use a computer)

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leisure</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

How many hours do you watch TV/video/DVD daily?

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<tbody>
<tr>
<td>Less than 1 hour</td>
<td></td>
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<tr>
<td>1-3 hours</td>
<td></td>
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<tr>
<td>More than 6 hours</td>
<td></td>
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</tbody>
</table>

**Culture/Life Philosophy**

How often in the last 6 months have you been to:

(One X per line)

<p>| | | | | |</p>
<table>
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<th></th>
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</thead>
<tbody>
<tr>
<td>More than 3 x/mo.</td>
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<td></td>
</tr>
<tr>
<td>1-3 x/mo.</td>
<td></td>
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<tr>
<td>1-6 x/6 mos.</td>
<td></td>
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</table>

Museum/art exhibition

Concert, theatre, film

Church/chapel

Sports event

How many times in the last 6 months have you participated in the following:

(One X per line)

<p>| | | | | |</p>
<table>
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<tr>
<th></th>
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<tbody>
<tr>
<td>More than 1 x/week</td>
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<td></td>
</tr>
<tr>
<td>1x/week</td>
<td></td>
<td></td>
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<tr>
<td>1-3x/6 mos.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5x/6 mos.</td>
<td></td>
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</tbody>
</table>

Association or club meeting/activity

Music, singing, theatre

Parish work

Outdoor activities

Dance

Worked out, sports

Which life philosophy is most like yours? (One X only)

<p>| | | | | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Christian</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atheistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
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</tbody>
</table>

When something bad happens in my life, I think that it happened for a purpose.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
<td></td>
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</tbody>
</table>

I seek God’s help when I need strength and solace.

<p>| | | | | |</p>
<table>
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<tr>
<th></th>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Never</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Often</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Personality**

Describe yourself as you normally are:

- Are you a life of the party type person? [ ] Yes [ ] No
- Are you mostly quiet and reserved when you are around other people? [ ] Yes [ ] No
- Do you like meeting new people? [ ] Yes [ ] No
- Do you like to have a lot of life and excitement around you? [ ] Yes [ ] No
- Are you a relatively lively person? [ ] Yes [ ] No
- Do you usually take the first step to make new friends? [ ] Yes [ ] No
- Are you often worried? [ ] Yes [ ] No
- Are your feelings easily hurt? [ ] Yes [ ] No
- Do you often feel that you lose interest? [ ] Yes [ ] No
- Do you have nervous problems? [ ] Yes [ ] No
- Do you often feel tired and indifferent/unmotivated without reason? [ ] Yes [ ] No
- Do you worry that terrible things might happen? [ ] Yes [ ] No

**Headaches**

Have you had headaches in the last year? [ ] Yes [ ] No

*If No, skip to Respiratory Tract*

*If Yes, what type of headache?*
- Migraine [ ]
- Other headache [ ]

Average number of days a month with headaches:
- Less than 1 day [ ]
- 1-6 days [ ]
- 7-14 days [ ]
- More than 14 days [ ]

What is the average strength of your headaches?
- Mild (does not affect activity) [ ]
- Moderate (affects activity) [ ]
- Strong (hinders activity) [ ]

How long does the headache usually last?
- Less than 4 hours [ ]
- 1-3 days [ ]
- 4 hours – 1 day [ ]
- More than 3 days [ ]

Are the headaches usually characterized by or accompanied by:
- Throbbing/thumping pain [ ] Yes [ ] No
- Pressing pain [ ] Yes [ ] No

**Before or during the headache, have you had temporary?**
- Visual disturbances (zigzag lines, flickering/flashing light, fogged vision) [ ] Yes [ ] No
- Numbness in half of your face or hand [ ] Yes [ ] No

Write the number of days you have been absent from work or school in the last month because of headaches [ ] days

**Respiratory Tract**

Do you cough daily in periods of the year? [ ] Yes [ ] No

*If Yes:*
- Do you usually bring up phlegm when coughing? [ ] Yes [ ] No
- Have you had a cough with phlegm for periods of at least 3 months during each of the last two years? [ ] Yes [ ] No
- Do you have or have you had hayfever or nasal allergies? [ ] Yes [ ] No

*If Yes:*
- Have you had hayfever/allergy symptoms in the last 12 months? [ ] Yes [ ] No

In the last 12 months have you woken during the night because you were short of breath? [ ] Yes [ ] No

**Muscles and Joints**

In the last year, have you had pain or stiffness in muscles or joints that has lasted at least 3 consecutive months? [ ] Yes [ ] No

*If No, skip to question 30*

Where have you had this pain or stiffness? (One or more Xs)
- Neck [ ]
- Shoulders [ ]
- Upper back [ ]
- Elbows [ ]
- Lower back [ ]
- Wrists/hands [ ]
- Hips [ ]
- Knees [ ]
Ankles/feet  
Have you had this pain/stiffness on both the right and left side of your body?  
Yes  No

Does this pain/stiffness hinder your daily activities?  
Work  Yes  No  Leisure

Have you had back surgery?  
If Yes,  
Type of back surgery
Prolapse/sciatica surgery  
Fixation  
Other

Metabolism
Has it ever been verified that you have/have had:  
Yes  No  
If Yes, write age first time  
Hypothyroidism (too low metabolism)  
Hyperthyroidism (too high metabolism)  yrs old  yrs old

If Yes:  
Did you take Neo-Mercazole?  yrs old
Have you had radioiodine treatment?  yrs old

Abdomen
Have you had stomach pain or discomfort in the last 12 months?  
Yes, much  Yes, a little  No, never  
If No, skip to question 34

If Yes:  
Is it localized in the upper stomach?  Yes  No

in the last 3 months, have you had this as often as 1 day a week for at least 3 weeks?  
Is the pain/discomfort relieved by having a bowel movement?  
Is the pain/discomfort related to more frequent or less frequent bowel movements than normal?  
Is the pain/discomfort related to the stool being softer or harder than normal?  
Do you have this pain/discomfort after eating?  

To what degree have you had the following in the last 12 months:

Nausea  Never  A little  Much
Heartburn/acid regurgitation  
Diarrhoea  
Constipation  
Alternating constipation and diarrhoea  
Bloating

How You Feel
Read each item below and place an X next to the reply that comes closest to how you have been feeling in the past week (only one X per item). Do not take too long over your replies; your immediate reaction to each item will probably be more accurate than a long, thought-out response.

I feel tense or ‘wound up’
Not at all  From time to time, occasionally  A lot of the time  Most of the time

I still enjoy the things I used to enjoy
Definitely as much  Only a little  
Not quite so much  Hardly at all

I get a sort of frightened feeling as if something awful is about to happen
Very definitely and quite badly  
A little, but it doesn’t worry me  
Yes, but not too badly  
Not at all

I can laugh and see the funny side of things
As much as I always could  Definitely not so much now  
Not quite so much now  
Not at all

Worrying thoughts go through my mind
A great deal of the time  Not too often  
A lot of the time  Very little

I feel cheerful
Never  Sometimes  Not often  
Not at all  

I can sit at ease and feel relaxed
Definitely  Not often  
Usually  Not at all

I feel as if I’m slowed down
Nearly all the time  Sometimes  
Very often  Not at all
**I get a sort of frightened feeling like ‘butterflies’ in the stomach**

- Not at all
- Occasionally
- Very often

**I have lost interest in my appearance**

- Definitely
- I may not take quite as much care
- I take just as much care as ever

**I feel restless as if I have to be on the move**

- Very much indeed
- Not very much
- Not at all

**I look forward with enjoyment to things**

- As much as I ever did
- Rather less than I used to
- Definitely less than I used to
- Hardly at all

**I get sudden feelings of panic**

- Very often indeed
- Not very often
- Not at all

**I can enjoy a good book or radio or TV programme**

- Often
- Not often
- Very seldom

---

**Sleep**

**How often in the last 3 months have you:**

- Snored loudly (bothersome)
- Stopped breathing when you were sleeping (Sleep apnoea)
- Had difficulty falling asleep at night
- Woken up repeatedly during the night
- Woken too early and couldn’t get back to sleep
- Felt sleepy during the day
- Sweat while sleeping (night-time)
- Woken with a headache
- Felt an uncomfortable or pins and needles feeling in your legs

**Alcohol**

*If you do not drink alcohol, skip to question 54.*

- Yes
- No

**Have you ever felt that you should reduce your alcohol intake?**

**Have other people ever criticised your use of alcohol?**

**Have you ever felt bad or guilty because of your use of alcohol?**

**Have you ever had a drink first thing in the morning as a pick-me-up or to calm your nerves or to cure a hangover?**

**Diet**

**How many pieces of bread do you usually eat?**

*Put an X for each type of bread*

<table>
<thead>
<tr>
<th>0-4 pr week</th>
<th>5-7 pr week</th>
<th>2-3 pr day</th>
<th>4-5 pr day</th>
<th>6 or more pr day</th>
</tr>
</thead>
<tbody>
<tr>
<td>White bread</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wholemeal/medium ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multigrain wholemeal/coarsely ground</td>
<td></td>
<td></td>
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</tbody>
</table>

**How often do you normally eat these meals?**

*For each meal: Seldom/never, 1-2 x a week, 3-4 x a week, 5-6 x a week or Everyday*  

<table>
<thead>
<tr>
<th>Meal</th>
<th>Seldom/never</th>
<th>1-2 x a week</th>
<th>3-4 x a week</th>
<th>5-6 x a week</th>
<th>Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warm dinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supper/evening snack</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other meal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Midnight snack (24.00-06.00)</td>
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</tbody>
</table>

**What type of fat do most often use?**

*For each line: Butter, Hard marg., Soft/light margarine, Oils, Don’t use*
**Dental Health**

Have you been to the dentist in the last 12 months?
- Yes [ ]
- No [ ]

How would you say your dental health is?
- Very bad [ ]
- Good [ ]
- Bad [ ]
- Very good [ ]
- OK [ ]

Is good dental health important to you?
- Very much [ ]
- A little [ ]
- Much [ ]
- Svært lite [ ]
- Somewhat [ ]

**Use of Non-Prescription Medicine**

How often have you taken non-prescription medicine for the following problems in the last month:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Seldom/never</th>
<th>1-3 x a week</th>
<th>4-6 x a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heartburn/acid regurgitation</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Constipation</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Headache</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Pain in muscles/joints</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

Have you taken any of these non-prescription medicines at least once a week in the last month?
- Yes [ ]
- No [ ]

Paracetamol, Paracet, Panodil, Pamol, Pinex, Perfalgan [ ]
Albyl E (500 mg), Aspirin, Globoïd, Dispril [ ]
Ibuprofen, Ibux, Ibuprox, Ibumetin, Brufen [ ]
Naproxen, Naprosyn, Ledox [ ]
Other [ ]

**How You Feel Now**

Do you feel, for the most part, strong and fit or tired and worn out?
- Very strong and fit [ ]
- Strong and fit [ ]
- Somewhat strong and fit [ ]
- Somewhat in between [ ]
- Somewhat tired and worn out [ ]
- Tired and worn out [ ]
- Very tired and worn out [ ]
Additional Section Men 20-29

Employment

Is your work so physically demanding that you are often physically worn out after a day’s work? (Only one X)

Yes, nearly always ☐ Seldom ☐
Quite often ☐ Never, or almost never ☐

Does your work require so much concentration and attention that you often feel worn out after a day’s work? (Only one X)

Yes, nearly always ☐ Seldom ☐
Quite often ☐ Never, or almost never ☐

All things considered, how much do you enjoy your work? (Only one X)

A great deal ☐ Not much ☐
A fair amount ☐ Not at all ☐

Your Feelings in the Last 14 Days

In the last two weeks, have you: (One X for each line)

Been continuously afraid and anxious ☐
Felt tense and restless ☐
Felt hopelessness when you think about the future ☐
Felt down and sad ☐
Worried too much about various things ☐

Life Events

Have you experienced any of the following in the last 10 years? (Put X for each question)

No Yes

Gambling

Have you ever felt the need to gamble with continuously increasing amounts of money?

Yes ☐ No ☐

Have you ever had to lie to people who are important to you about how much you lost gambling?

Yes ☐ No ☐

Eating Habits

Below are listed things that concern your eating habits. Put an X in the boxes according to how they apply to you. (Put X for each line)

When I first begin eating, it is difficult to stop.
I spend too much time thinking about food.
I feel that food controls my life.
I cut my food into small pieces.
I take longer than others to eat my meals.
Older people think I’m too thin.
I feel that others pressure me to eat.
I vomit after I have eaten.

Life Events

Have you experienced any of the following in the last 10 years? (Put X for each question)

No Yes

Gambling

Have you ever felt the need to gamble with continuously increasing amounts of money?

Yes ☐ No ☐

Have you ever had to lie to people who are important to you about how much you lost gambling?

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Life Events

Have you experienced any of the following in the last 10 years? (Put X for each question)

No Yes

Gambling

Have you ever felt the need to gamble with continuously increasing amounts of money?

Yes ☐ No ☐

Have you ever had to lie to people who are important to you about how much you lost gambling?

Yes ☐ No ☐

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Life Events

Have you experienced any of the following in the last 10 years? (Put X for each question)

No Yes

Gambling

Have you ever felt the need to gamble with continuously increasing amounts of money?

Yes ☐ No ☐

Have you ever had to lie to people who are important to you about how much you lost gambling?

Yes ☐ No ☐

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Life Events

Have you experienced any of the following in the last 10 years? (Put X for each question)

No Yes

Gambling

Have you ever felt the need to gamble with continuously increasing amounts of money?

Yes ☐ No ☐

Have you ever had to lie to people who are important to you about how much you lost gambling?

Yes ☐ No ☐

Eating Habits

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Older people think I’m too thin.
I feel that others pressure me to eat.
I vomit after I have eaten.
### Additional Section Women 20-29

#### Pregnancy and Birth Control

Not including pregnancies or post-natal periods, have you ever not menstruated for at least 6 months?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If Yes,

- How many times?

| times |

Including all pregnancies, how many times have you been pregnant?

| times |

Have you ever tried for more than one year to become pregnant?

| Yes | No |

If Yes,

- How old were you the first time you had problems becoming pregnant?

| yrs old |

Do you use/take or have you used/taken:

<table>
<thead>
<tr>
<th>Birth control pills</th>
<th>Now</th>
<th>Before, but not now</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth control patch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other hormone birth control (Injection, vaginal ring, implant, IUD/coil)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

If you have taken birth control pills:

- How old were you when you first began taking them?

| yrs old |

How many years in total have you taken birth control pills?

| Less than 1 yr | 1-3 yrs | 4-10 yrs | over 10 yrs |

#### Urinary Tract

Do you unintentionally leak urine?

| Yes | No |

If No, skip to question 72

If Yes:

- How often do you leak urine?

  | Less than once a month | One or more times a week | Every day/night |

- How much urine usually leaks each time?

  | Drops | Small amount | Quite a lot |

#### Employment

Is your work so physically demanding that you are often physically worn out after a day’s work? *(Only one X)*

| Yes, nearly always | Seldom | Quite often | Never, or almost never |

Does your work require so much concentration and attention that you often feel worn out after a day’s work? *(Only one X)*

| Yes, nearly always | Seldom | Quite often | Never, or almost never |

All things considered, how much do you enjoy your work? *(Only one X)*

| A great deal | Not much | A fair amount | Not at all |

#### Your Feelings in the Last 14 Days

In the last two weeks, have you: *(One X for each line)*

<table>
<thead>
<tr>
<th>No</th>
<th>A little</th>
<th>A good amount</th>
<th>Very much</th>
</tr>
</thead>
</table>

- Been continuously afraid and anxious
- Felt tense and restless
- Felt hopelessness when you think about the future
- Felt down and sad
- Worried too much about various things
Life Events

Have you experienced any of the following in the last 10 years? (Put an X for each question)

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Last 12 mos.</td>
<td>Earlier</td>
</tr>
<tr>
<td>Had problems at work or school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had financial problems?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had problems or conflicts with family or friends?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had big problems in your love life?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Been seriously ill or injured?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have those nearest you been seriously ill or injured?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eating Habits

Below are listed things that concern your eating habits. Put an X in the boxes according to how they apply to you. (Put an X for each line)

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I first begin eating, it is difficult to stop.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I spend too much time thinking about food.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel that food controls my life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I cut my food into small pieces.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I take longer than others to eat my meals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older people think I'm too thin.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel that others pressure me to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I vomit after I have eaten.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Gambling

Have you ever felt the need to gamble with continuously increasing amounts of money? | Yes | No |
|--------------------------------------|-----|----|

Have you ever had to lie to people who are important to you about how much you lost gambling?
Additional Section Men 30-69
Evaluating Your Job

Answer if you are or have been employed.

Respond to the following statements/questions about where you work.

There is a good collegiality at work.
Strongly agree □ Agree □ Disagree □ Strongly disagree □

My co-workers are there for me (support me).
Strongly agree □ Agree □ Disagree □ Strongly disagree □

I get along well with my co-workers.
Strongly agree □ Agree □ Disagree □ Strongly disagree □

Are you bullied/harassed at work?
Yes, often □ Yes, sometimes □ No, seldom □ No, could say never □

Does your job require you to work very fast?
Yes, often □ Yes, sometimes □ No, seldom □ No, could say never □

Does your job require you to work very hard?
Yes, often □ Yes, sometimes □ No, seldom □ No, could say never □

Does your job require too great a work effort?
Yes, often □ Yes, sometimes □ No, seldom □ No, could say never □

Does your job require creativity?
Yes, often □ Yes, sometimes □ No, seldom □ No, could say never □

Do you have the possibility to decide for yourself how to carry out your work?
Yes, often □ Yes, sometimes □ No, seldom □ No, could say never □

Do you have the possibility to decide for yourself what should be done in your work?
Yes, often □ Yes, sometimes □ No, seldom □ No, could say never □

Is your work so physically demanding that you are often physically worn out after a long day's work?
Yes, nearly always □ Seldom □ Quite often □ Never, or almost never □

Leg Pain
Do you have ulcer(s) on your toes, foot ankle that will not heal?
Yes □ No □

Do you have pain in one or both legs when you walk?
Yes □ No □

If Yes, Where does it hurt the most?
Foot □ Leg □ Thigh □ Hip □

Does the pain go away if you stand still a while?
Yes □ No □

Do you have pain in your legs when you are resting?
Yes □ No □

If Yes: Is the pain worse when you lay in bed?
Yes □ No □

Do you have less pain if you have your legs lower, such as over the edge of the bed?
Yes □ No □

Have you had pain in your legs continuously for more than 14 days?
Yes □ No □

Have you taken pain relievers because of pain in your legs?
Yes □ No □

Vision
Do you have any of the following eye conditions?
Yes □ No □

Cataract □

Glaucoma (raised eye pressure) □

Age-Related Macular Degeneration (retinal calcification) □

Memory
Do you have problems with your memory?
No, none □ Yes, some □ Yes, a lot □
Has your memory changed since you were younger?
- No
- Yes, some
- Yes, a lot

Do you have trouble remembering:
- Things that happened a few minutes ago?
- Other peoples’ names?
- Dates?
- To do something you have planned to do?
- Things that happened a few days ago?
- Things that happened years ago?
- Enough to be able to follow along in a conversation?

Over the last month, how difficult have you found it to postpone urination?
- Never
- 1 out of 3 times
- 1 out of 5 times
- 2 out of 3 ganger
- Nesten altid

Over the past month, how often have you had a weak urinary stream?
- Never
- 1 out of 3 times
- 1 out of 5 times
- 2 out of 3 times
- Almost always

Over the past month, how often have you had to push or strain to begin urination?
- Never
- 1 out of 3 times
- 1 out of 5 times
- 2 out of 3 times
- Almost always

Do you unintentionally leak urine?
- Yes
- No

If Yes:
- How often do you leak urine?
  - Less than once a month
  - One or more times a week
  - Several times a month
  - Every day/night

- How much urine usually leaks each time?
  - Drops
  - A small amount
  - Quite a lot

In which situations might you leak urine?
- (You may X several answers)
  - When you cough, sneeze, lift something heavy
  - When having a sudden urge to urinate
  - Drops at end of or after urinating
  - Drops all the time, independent of urinating

How do you feel about having urinary incontinence?
- Not a problem
- A problem
- A slight problem
- A great problem
- A very great problem

How old were you when you became incontinent?

Have you consulted a doctor?
- Yes
- No
because of urinary incontinence?

**Additional Section Women 30-69**

**Menstruation, Birth Control and Pregnancy**

Not including during pregnancy or post-natal period, have you ever not gotten a period for at least 6 months (premenopause)?

- Yes
- No

If Yes, How many times?

In total, how many times have you been pregnant?

- Yes
- No

Have you ever tried for more than one year to become pregnant?

If Yes, How old were you the first time you tried to become pregnant?

Have you ever received hormone treatment to become pregnant?

If Yes, Have you received this treatment in the last 3 months?

Do you use/take or have you used/taken:

- Birth control pills
- Birth control patch
- Other hormone birth control (injection, vaginal ring, implant, IUD/coil)

If you have taken birth control pills: How old were you when you first began taking them?

How many years in total have you taken birth control pills?

- Less than 1 yr
- 1-3 yrs
- 4-10 yrs
- Over 10 yrs

**Menopause**

(If you are premenopausal, skip to 75)

Do you have/have you had hot flashes due to menopause?

- During the day
- During night
- Day and night
- Haven’t had any

If you have had hot flashes, how would you describe them?

- Very intense
- Moderately intense
- Hardly noticeable

Have you been to a doctor because of this?

- No
- Yes

Have you ever taken/used medicine that contains oestrogen?

- Tablets or patches (prescribed by a doctor)
- Creams or suppositories

If you have taken/used prescription oestrogen: How old were you when you began?

How old are/were you the last time you took/used it?

If you take/use or have taken/used oestrogen tablets or patches, why did you begin?

- Alleviate menopausal symptoms
- Prevent osteoporosis
- Other

If you have previously taken/used oestrogen tablets or patches, why did you stop?

- No longer have/had symptoms
- Afraid of side effects
- Experienced bothersome side effects
- Other

**Operations/Radiation Therapy in the Lower Abdomen**

Have you had both ovaries surgically removed?

- No
- Yes
- Don’t know

If Yes, How old were you then?

Have you had your womb surgically removed (hysterectomy)?

- No
- Yes
- Don’t know

If Yes, How old were you then?

Have you ever had radiation therapy in your pelvic region?

- No
- Yes
- Don’t know

If Yes, How old were you then?
Urinary Tract

How often do you usually urinate during the day?
1-4 times ☐ 8-11 times ☐
5-7 times ☐ over 11 times ☐

How many times do you get up during the night to urinate?
None ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more ☐

If you get up during the night to urinate, is this a problem for you?
Not a problem ☐ It's a problem ☐
Somewhat of a problem ☐ It's a very big problem ☐

Do you feel a sudden, compelling urge to urinate that is difficult to suppress?
Never ☐ Several times a week ☐
Monthly ☐ Daily ☐

Do you unintentionally leak urine?
Yes ☐ No ☐
If No, skip to question 84

If Yes:
How often do you leak urine?
Less than once a month ☐ One or more times a month ☐
One or more times a week ☐ Every day/night ☐

How much urine usually leaks each time?
Drops ☐ Small amount ☐ Quite a lot ☐

Do you leak urine when you cough, sneeze, laugh or lift something heavy?
Yes ☐ No ☐

When you leak urine is it accompanied by a sudden and strong urge to urinate?
Yes ☐ No ☐

How do you feel about having urinary incontinence?
Not a problem ☐ A great problem ☐
A slight problem ☐ A very great problem ☐
A moderate problem ☐

How old were you when you became incontinent?
[ ] yrs old

Have you consulted a doctor because of urinary incontinence?
Yes ☐ No ☐

Have you ever been treated for urinary incontinence? (Several Xs possible here)
No, I have never had urinary incontinence ☐
No, I had urinary incontinence, but became better on its own ☐

If Yes, what type of treatment?
Operation ☐ Medicine ☐
Pelvic floor exercises ☐ Other ☐

Bowel Movements

Have you had uncontrollable flatulence in the last month?
Never/seldom ☐ Weekly ☐ Daily ☐

Have you leaked stool (faecal incontinence) in the last month?
Never/seldom ☐ Weekly ☐ Daily ☐

If you answered Yes to one of the above questions, does faecal incontinence affect your daily life?
Never/seldom ☐ Weekly ☐ Daily ☐

Are you able to hold back the stool for 15 minutes after you first feel the urge to evacuate your bowels?
Yes ☐ No ☐

Evaluating Your Job

Answer if you are or have been employed.

Respond to the following statements/questions about where you work.

There is a good collegiality at work.
Strongly agree ☐ Agree ☐
Disagree ☐ Strongly disagree ☐

My co-workers are there for me (support me).
Strongly agree ☐ Agree ☐
Disagree ☐ Strongly disagree ☐

I get along well with my co-workers.
Strongly agree ☐ Agree ☐
Disagree ☐ Strongly disagree ☐

Are you bullied/ harassed at work?
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes, often</th>
<th>Yes, sometimes</th>
<th>No, seldom</th>
<th>No, could say never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your job require you to work very fast?</td>
<td>Yes, often</td>
<td>Yes, sometimes</td>
<td>No, seldom</td>
<td>No, could say never</td>
</tr>
<tr>
<td>Does your job require you to work very hard?</td>
<td>Yes, often</td>
<td>Yes, sometimes</td>
<td>No, seldom</td>
<td>No, could say never</td>
</tr>
<tr>
<td>Does your job require too great a work effort?</td>
<td>Yes, often</td>
<td>Yes, sometimes</td>
<td>No, seldom</td>
<td>No, could say never</td>
</tr>
<tr>
<td>Does your job require creativity?</td>
<td>Yes, often</td>
<td>Yes, sometimes</td>
<td>No, seldom</td>
<td>No, could say never</td>
</tr>
<tr>
<td>Do you have the possibility to decide for yourself how to carry out your work?</td>
<td>Yes, often</td>
<td>Yes, sometimes</td>
<td>No, seldom</td>
<td>No, could say never</td>
</tr>
<tr>
<td>Do you have the possibility to decide for yourself what should be done in your work?</td>
<td>Yes, often</td>
<td>Yes, sometimes</td>
<td>No, seldom</td>
<td>No, could say never</td>
</tr>
</tbody>
</table>

**Leg Pain**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have ulcer(s) on your toes, foot ankle that will not heal?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have pain in one or both legs when you walk?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*If Yes,*

<table>
<thead>
<tr>
<th>Where does it hurt the most?</th>
<th>Foot</th>
<th>Leg</th>
<th>Thigh</th>
<th>Hip</th>
</tr>
</thead>
</table>

Does the pain go away if you stand still a while?

**Eating Disorders**

Place a circle around the number that best describes your eating habits during the last month.

<table>
<thead>
<tr>
<th>Are you satisfied with your eating habits?</th>
<th>Very satisfied</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you eaten to comfort yourself or because you were unhappy?</td>
<td>Not at all</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Every-day</td>
</tr>
</tbody>
</table>
**Have you felt guilty about eating?**
- Not at all
- 1 2 3 4 5 6 7
- Every-day

**Have you felt that it was necessary for you to use a strict diet or other eating rituals to control your eating?**
- Not at all
- 1 2 3 4 5 6 7
- Every-day

**Have you felt that you are too fat?**
- Not at all
- 1 2 3 4 5 6 7
- Every-day
Additional Section Men 70+

Leg Pain

Do you have ulcer(s) on your toes, foot ankle that will not heal?  
Yes  No

Do you have pain in one or both legs when you walk?  

If Yes,  
Where does it hurt the most?  
Foot  Leg  Thigh  Hip

Does the pain go away if you stand still a while?  
Yes  No

Do you have pain in your legs when you are resting?  

If Yes:  
Is the pain worse when you lay in bed?  

Do you have less pain if you have your legs lower, such as over the edge of the bed?  

Have you had pain in your legs continuously for more than 14 days?  

Have you taken pain relievers because of pain in your legs?  

Activities of Daily Life

Can you do the following daily tasks without the help of others?  

Yes  No

Walk around indoors on the same floor
Go to the toilet
Wash yourself
Take a bath or shower
Dress and undress yourself
Go to bed and get up
Eat

Can you do the following daily tasks without the help of others?

Prepare warm meals
Do light housework (ex: wash dishes)
Do heavier housework (ex: wash floors)
Wash clothes
Do the shopping
Pay bills
Take medicines
Go out
Take the bus

Memory

Do you have problems with your memory?  
No, none  Yes, some  Yes, a lot

Has your memory changed since you were younger?  
No  Yes, some  Yes, a lot

Do you have trouble remembering:  

Never  Sometimes  Often
Things that happened a few minutes ago?
Other peoples’ names?
Dates?
To do something you have planned to do?
Things that happened a few days ago?
Things that happened years ago?
Enough to be able to follow along in a conversation?

Falls

Have you fallen and hurt yourself in the last year?  
No  Yes

If Yes,  
Where did it happen?  
Indoors  Outdoors

Have you been to a doctor in the last year because of an injury caused by a fall?  
Yes  No

Have you been admitted to hospital in the last year because of an injury?
caused by a fall?
Have you fallen in the last 3 months? □  □
Do you have problems with your balance? □  □

Use of Health Services

Have you had home care help in the last 12 months? □  □
If Yes, Do you have enough home care help? □  □
Have you received home nursing care in the last 12 months? □  □
If Yes, Do you receive enough home nursing care? □  □
Have you been admitted to a nursing home in the last 12 months? □  □

Vision

Do you have any of the following eye conditions? □  □
Cataract □  □
Glaucoma (raised eye pressure) □  □
Age-Related Macular Degeneration (retinal calcification) □  □

Urinary Tract

How often do you usually urinate during the day? □  □
1-4 times  □
8-11 times □
5-7 times □
More than 11 times □

How many times do you get up during the night to urinate? □  □
None □
1 □
2 □
3 □
4 or more □

If you get up during the night to urinate, is this a problem for you?
Not a problem □
It’s a problem □
Somewhat of a problem □
It’s a very big problem □

Do you feel a sudden, compelling urge to urinate that is difficult to suppress?
Never □
Several times a week □
Monthly □

Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?
Never □
1 out of 3 times □
2 out of 3 times □
Almost always □

Over the past month, how often have you had to urinate again less than 2 hours after you finished urinating?
Never □
1 out of 3 times □
2 out of 3 times □
Almost always □

Over the past month, how often have you found you stopped and started again several times when you urinated?
Never □
1 out of 3 times □
2 out of 3 times □
1 out of 5 times □
Almost always □

Over the last month, how difficult have you found it to postpone urination?
Never □
1 out of 3 times □
2 out of 3 times □
1 out of 5 times □
Almost always □

Over the past month, how often have you had a weak urinary stream?
Never □
1 out of 3 times □
2 out of 3 times □
Almost always □

Over the past month, how often have you had to push or strain to begin urination?
Never □
1 out of 3 times □
2 out of 3 times □
Almost always □

Do you unintentionally leak urine? □  □
If No, skip to question about 89

If Yes:
How often do you leak urine? □  □
Less than once a month □
One or more times a week □
Several times a month □
Every day/night □

How much urine usually leaks each time? □  □
Drops □
Small amounts □
Quite a lot □

In which situations might you leak urine? □  □
(You may X several answers)
When you cough, sneeze, lift something heavy  
When having a sudden urge to urinate  
Drops at end of or after urinating  
Drops all the time, independent of urinating  

How do you feel about having urinary incontinence?  
Not a problem  
A slight problem  
A moderate problem  
A great problem  
A very great problem  

How old were you when you became incontinent?  yrs old  

Have you consulted a doctor because of urinary incontinence?  
Yes  
No  
Additional Section Women 70+
Pregnancy, Children and Hormone Therapy

In total, how many times have you been pregnant?  
Have you ever tried for more than one year to become pregnant? Yes  No  

If Yes,  How old were you the first time you had problems becoming pregnant? yrs old 

Do you have/have you had hot flashes due to menopause? During the day  During night  Day and night  Haven't had any  

If you have had hot flashes, how would you describe them? Very intense  Moderately intense  Hardly noticeable  

Have you been to a doctor because of this? No  Yes  

Have you ever taken/used medicine that contains oestrogen? Now  Previously  Never 

If you have taken/used prescription oestrogen:  How old were you when you began? yrs old 

How old are/were you the last time you took/used it? yrs old 

If you take/use or have taken/used oestrogen tablets or patches, why did you begin? Alleviate menopausal symptoms Prevent osteoporosis Other  

If you have previously taken/used oestrogen tablets or patches, why did you stop? No longer have/had symptoms Experienced bothersome side effects Afraid of side effects Other  

Operations/Radiation Therapy in the Lower Abdomen

Have you had both ovaries surgically removed? No  Yes  Don’t know  

If Yes,  How old were you then? yrs old 

Have you had your womb surgically removed (hysterectomy)? No  Yes  Don’t know  

If Yes,  How old were you then? yrs old 

Have you ever had radiation therapy in your pelvic region? No  Yes  Don’t know  

If Yes,  How old were you then? yrs old 

Urinary Tract

How often do you usually urinate during the day? 1-4 times  8-11 times 5-7 times  over 11 times  

How many times do you get up during the night to urinate? None  1  2  3  4 or more  

If you get up during the night to urinate, is this a problem for you? Not a problem  It’s a problem  Somewhat of a problem  It’s a very big problem  

Do you feel a sudden, compelling urge to urinate that is difficult to suppress? Never  Several times a week  Monthly  Daily  

Do you unintentionally leak urine? Yes  No  

If No, skip to question 79  

If Yes:  How often do you leak urine? Less than once a month  One or more times a week
One or more times a month  
Every day/night

How much urine usually leaks each time?
Drops  
Small amount  
Quite a lot

Do you leak urine when you cough, sneeze, laugh or lift something heavy?
Yes  
No

When you leak urine is it accompanied by a sudden and strong urge to urinate?

How do you feel about having urinary incontinence?
Not a problem  
A great problem  
A slight problem  
A very great problem  
A moderate problem

How old were you when you became incontinent?

Have you consulted a doctor because of urinary incontinence?

Have you ever been treated for urinary incontinence? (Several Xs possible here)
No, I have never had urinary incontinence  
No, I had urinary incontinence, but became better on its own  
Yes

If Yes, what type of treatment?
Operation  
Medicine  
Pelvic floor exercises  
Other

Bowel Movements

Have you had uncontrollable flatulence in the last month?
Never/seldom  
Weekly  
Daily

Have you leaked stool (faecal incontinence) in the last month?
Never/seldom  
Weekly  
Daily

If you answered Yes to one of the above questions, does faecal incontinence affect your daily life?

Are you able to hold back the stool for 15 minutes after you first feel the urge to evacuate your bowels?
Yes  
No

Leg Pain

Do you have ulcer(s) on your toes, foot ankle that will not heal?
Yes  
No

Do you have pain in one or both legs when you walk?

If Yes, Where does it hurt the most?
Foot  
Leg  
Thigh  
Hip

Does the pain go away if you stand still a while?

Do you have pain in your legs when you are resting?

If Yes:
Is the pain worse when you lay in bed?

Do you have less pain if you have your legs lower, such as over the edge of the bed?

Have you had pain in your legs continuously for more than 14 days?

Have you taken pain relievers because of pain in your legs?

Activities of Daily Life

Can you do the following daily tasks without the help of others?

Walk around indoors on the same floor  
Go to the toilet  
Wash yourself  
Take a bath or shower  
Dress and undress yourself  
Go to bed and get up  
Eat

Other Daily Tasks

Do you have a driver’s licence?

If Yes, Do you still drive?

Can you do the following daily tasks without the help of others?
<table>
<thead>
<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare warm meals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do light housework (ex: wash dishes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do heavier housework (ex: wash floors)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wash clothes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do the shopping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pay bills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take medicines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take the bus</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Memory

**Do you have problems with your memory?**

- No, none [ ]
- Yes, some [ ]
- Yes, a lot [ ]

**Has your memory changed since you were younger?**

- No [ ]
- Yes, some [ ]
- Yes, a lot [ ]

**Do you have trouble remembering:**

- Things that happened a few minutes ago? [ ] [ ] [ ]
- Other peoples’ names? [ ] [ ] [ ]
- Dates? [ ] [ ] [ ]
- To do something you have planned to do? [ ] [ ] [ ]
- Things that happened a few days ago? [ ] [ ] [ ]
- Things that happened years ago? [ ] [ ] [ ]
- Enough to be able to follow along in a conversation? [ ] [ ] [ ]

### Falls

**Have you fallen and hurt yourself in the last year?**

- No [ ]
- Yes [ ]

**If Yes,**

**Where did it happen?**

- Indoors [ ]
- Outdoors [ ]

**Have you been to a doctor in the last year because of an injury caused by a fall?**

- Yes [ ]
- No [ ]

**Have you been admitted to hospital in the last year because of an injury caused by a fall?**

- Yes [ ]
- No [ ]

**Have you fallen in the last 3 months?**

- Yes [ ]
- No [ ]

**Do you have problems with your balance?**

- Yes [ ]
- No [ ]

### Use of Health Services

**Have you had home care help in the last 12 months?**

- Yes [ ]
- No [ ]

**If Yes,**

**Do you have enough home care help?**

- Yes [ ]
- No [ ]

**Have you received home nursing care in the last 12 months?**

- Yes [ ]
- No [ ]

**If Yes,**

**Do you receive enough home nursing care?**

- Yes [ ]
- No [ ]

**Have you been admitted to a nursing home in the last 12 months?**

- Yes [ ]
- No [ ]

### Vision

**Do you have any of the following eye conditions?**

- Yes [ ]
- No [ ]

- Cataract [ ]
- Glaucoma (raised eye pressure) [ ]
- Age-Related Macular Degeneration (retinal calcification) [ ]
Fra: Regional komité for medisinsk og helsefaglig forskningsetikk REK midt

Til: Liv Berit Augestad
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FYSISK AKTIVITET OG MENTAL HELSE INFORMASJON OM VEDTAK

Merknader og vilkår:
- Komiteen finner at prosjektet ligger klart innenfor de rammer som er lagt for Helseundersøkelsen i Nord-Trøndelag (HUNT) og innenfor det samtykke som deltakerne har gitt til bruk av dette materialet.
- Komiteen ber om at grunnlagsdata ikke blir anonymisert, slettet eller destrueret, men blir oppbevart på en betryggende måte i minimum 5 år etter prosjektslutt av kontrollhensyn. Instanser som kan tenkes å kontrollere grunnlagsmaterialet er f.eks. forskningsansvarlige, Uredelighetsutvalget for forskning og Helsetilsynet.
- Prosjektleder skal sende sluttmelding til den regionale komiteen for medisinsk og helsefaglig forskningsetikk når forskningsprosjektet avsluttes. I sluttmeldingen skal resultatene presenteres på en objektiv og etterrettelig måte, som sikrer at både positive og negative funn fremgår, jf. hfl. § 12.

Vedtak:
"Regional komité for medisinsk og helsefaglig forskningsetikk, Midt-Norge godkjenner at prosjektet gjennomføres med de vilkår som er gitt."


Vennlig hilsen

Sven Erik Gisvold
leder, REK Midt

Hilde Eikemo
rådgiver, REK Midt