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The Role of the Five Factor Personality Traits in General Self-Rated Health

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Abstract

Self-ratings of health (SRH) are widely used in large surveys and have been shown to predict mortality over and above more objective health measures. However, the debate still continues about what SRH actually represents and what the processes underlying people's assessments of their health are. The main aim of this study is to examine the role of the Five-Factor Model (FFM) personality traits in general SRH assessment while controlling for the effects of objective health indicators, health-related quality of life, and subjective well-being (SWB) in a large population-based dataset of Estonian adults. A hierarchical linear regression analysis showed that only self-rated, but not informant-rated, Neuroticism explained additional variance in SRH when the other above-mentioned variables were taken into account. Our findings indicate that people's general SRH is a relatively good reflection of their objectively measured health status, but also that the way in which people experience and evaluate the quality of their lives – both in terms of SWB and more specific aspects of health – plays a significant role in general SRH assessments.

Keywords: general self-rated health; FFM personality traits; objective health indicators, health-related quality of life, subjective well-being

The Role of the Five Factor Personality Traits in General Self-Rated Health

Although self-rated health (SRH) is an individual and subjective conception of a person's health status, it is a solid predictor of the ultimate and arguably the most objective health measure, death (DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Jylhä, 2009; Mackenbach, Simon, Looman, & Joung, 2002). Longevity is, in turn, a good indicator of general health, because the people who live the longest are not usually those who have been struggling with diabetes, cancer, heart disease, or other chronic disorders (Friedman & Kern, 2014). Therefore, the way people view their health represents a valuable, possible even unique, source of data on their general health status (Spuling, Wurm, Tesch-Romer, & Huxhold, 2015), because it adds something more to the prediction of mortality than objective medical ratings alone (Idler & Benyamini, 1997). Although SRH has been shown to be a useful instrument and is widely used in a large number of major national and international surveys, its meaning and content are still not completely understood (see Jylhä, 2009, for a review). Ever since Suchman and colleagues' (1958) seminal report, hundreds of studies have been conducted with the aim of establishing the meaning, determinants, and dimensions of SRH in different populations. Despite impressive progress, it is still not entirely clear what exactly SRH measures, and therefore, understanding the factors that constitute and influence SRH remains an important research agendum (Fayers & Sprangers, 2002; Jylhä, 2009; Williams, Wasserman, & Lotto, 2003). Analysing SRH is important, not only for deciphering the SRH–mortality association, but also for understanding the way in which people judge information about health threats and behaviours and medical diagnoses and recommendations (Benyamini, Idler, Leventhal, & Leventhal, 2000). The main aim of the present study is to examine the role of the Five Factor Model (FFM) personality traits in general SRH assessment. However, in order to understand the association between SRH and

personality traits, it is important to ask what SRH actually means, and the factors that need to be taken into account before concluding that personality traits influence the evaluation of SRH.

What is Self-Rated Health?

In the broad sense, people's subjective perceptions of their health are thought to capture different physical, psychological, and social factors (Benyamini, 2008). In this paper, we conceptualize SRH as a consequence of a complex evaluation process (Jylhä, 2009), because it is thought to constitute assessing (currently unknown) arrays of perceptions and weighting them according to (equally unknown and varying) values and preferences (Idler & Benyamini, 1997). More specifically, we are interested in the general SRH that is most typically measured by a single item asking people how they would rate their health in general. There seem to be at least two stages in the process of health self-assessment (Jylhä, 2009): first, the evaluation of what the relevant components of one's health are; and second, the assessment of one's health in comparison with one's reference groups (e.g., age group) and health expectations. Previous studies have indicated an array of factors that individuals take into account when reporting their SRH – medical diagnoses and prescribed drugs (Jylhä, 2009), functional status and limitations (Mora, DiBonaventura, Idler, Leventhal, & Leventhal, 2008), experienced bodily sensations, such as pain and fatigue (Jylhä, 2009), number of chronic conditions (Spuling et al., 2015), and the overall subjective burden of disease (Benyamini et al., 2000). It is therefore important (although often not the case, see Jylhä, 2009 for a review) to control for clinically verified health data and objectively measured health indicators when analysing the role of personality traits in general SRH assessment.

Yet, traditional indicators of health status are also insufficient to explain differences in individuals' SRH (Benyamini et al., 2000). Due to various psychosocial factors (e.g., emotional

reactions, individual expectations, family support, etc.) different individuals may experience outwardly similar illnesses or physical disabilities rather differently, depending upon their context and interpretation of the effects of the disease on their functional status and quality of life. Therefore, we also examined people's health-related quality of life, which has been defined as the extent to which physical dysfunction, pain, and distress result in limitations on people's everyday behaviours, social activities, and psychological well-being (Lawton, 2001). Research has shown that poor health-related quality of life may be a proxy for other unmeasured confounders, such as disease severity, comorbid depression, socioeconomic status, and decreased access to or utilization of healthcare services (Nguyen & Henry, 2010). In addition, health-related quality of life outcomes have been found to be uniquely associated with FFM personality traits, beyond medical burden and demographics (Chapman, Duberstein, & Lyness, 2007). There is also some suggestion that general SRH status is in fact an indicator of health-related quality of life, which is considered to be a multidimensional concept and, as such, a broader concept than SRH. In the current study, we keep the two constructs separate but we acknowledge their possible theoretical and empirical links.

The Role of the FFM Personality Traits and Subjective Well-Being in SRH Assessment

The input people receive about their physical and mental health status, whether from body sensations or from health care professionals, must be processed and organized, and the manner in which people organize health information cognitively, in turn, affects how they perceive and report their health (Williams et al., 2003). In Jylhä's (2009) model of SRH, individual psychological factors, such as affective dispositions, create an important framework for evaluating the components of health and, as result, have an important influence on the individual's health evaluation. The tendency to experience frequent positive or negative affect

are strongly related to FFM personality traits, mostly to Extraversion and Neuroticism (e.g., Allik & Realo, 1997; Costa & McCrae, 1980), and personality trait levels have been shown not just to be associated with numerous common health outcomes, but also to predict them (Deary, Weiss, & Batty, 2010; Ferguson, 2013; Weston, Hill, & Jackson, 2015).

Personality traits are usually understood as enduring tendencies to feel, think, and behave in a characteristic way in similar life situations (Allik & McCrae, 2002). As Löckenhoff and colleagues (2008) have suggested, there are at least two pathways through which personality traits may influence ratings of subjective health. First, personality may influence SRH indirectly via its influence on objective health. Namely, personality traits may moderate physiological stress responses or promote healthy or unhealthy behaviour patterns. For instance, Neuroticism, which is the general tendency to experience different forms of negative affect (Costa & McCrae, 1992), is most likely associated with different health outcomes through physiological reactions to stress (Friedman & Kern, 2014; Löckenhoff et al., 2008). Neuroticism has, indeed, been found to be a robust correlate and predictor of many different mental and physical disorders, including comorbid conditions, and the frequency of mental and general health service use (Lahey, 2009). However, as recent studies show, a “healthy neuroticism” can also be a good thing, if a neurotic person has the ability to channel his or her worries and concerns into health-improving behaviours, including seeking medical advice without delay, which may substantially improve the prognosis of treatment (Friedman, 2000; Turiano, Mroczek, Moynihan, & Chapman, 2013). The other personality traits – Extraversion, Openness to Experience (Openness), Agreeableness, and Conscientiousness – have also been reported to be associated with health and longevity (Goodwin & Friedman, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007) and even to be associated with the risk of developing a disease (Weston et al., 2015). Extraversion has been

shown to be related to positive health outcomes through positive emotionality and social relationships and support, as well as better immune and neuroendocrine functioning (Roberts, et al., 2007). Openness may contribute to better health by enhancing the willingness to try new approaches to health care and stress management (Turiano, Spiro, & Mroczek, 2012), such as by endorsing a healthier diet (Mõttus et al., 2012). Higher Agreeableness seems to be most directly associated with disease processes, including vascular and cardiac dysfunction (Caspi, Roberts, & Shiner, 2005), through greater reactivity in the response to stressful experiences (Roberts et al., 2007), but also through health-related behaviours, such as better adherence to antibiotic therapy (Axelsson, 2013). And low Conscientiousness (e.g., low impulse control) is clearly implicated in health-risk behaviours, such as smoking, unhealthy eating habits, lack of exercise, unprotected sexual intercourse, and dangerous driving habits (Caspi et al., 2005; Ozer & Benet-Martinez, 2006). High Conscientiousness, in contrast, has protective effects and predicts decreased rates of mortality (Roberts et al., 2007).

The second pathway through which personality dimensions may influence SRH is through shaping people's subjective interpretations of their objective health status (Löckenhoff et al., 2008). One important moderator of symptom reporting has been found to be Neuroticism. People high in Neuroticism are more likely to report different symptoms, including unfounded symptoms (without a physiological basis), to amplify their symptoms and bodily sensations, and to ask for medical help, than those low in Neuroticism (Aiken-Morgan, Bichsel, Savla, Edwards, & Whitfield, 2014; Barsky, Goodson, Lane, & Cleary, 1988; Feldman, Cohen, Doyle, Skoner, & Gwaltney, 1999; Jerram & Coleman, 1999; Watson & Pennebaker, 1989), and consequently, they also show more negative interpretations of their health status (e.g., Benyamini et al., 2000) and a lower SRH. This second pathway, which prioritizes subjective interpretations of physical

health, suggests that individuals' views of their lives in general probably also play a significant role in SRH. Therefore, the present study includes another powerful measure of people's quality of life – subjective well-being (SWB).

Broadly speaking, SWB refers to a person's cognitive and affective evaluation of her or his life. People have high levels of SWB if they are satisfied with their lives, if they experience many pleasant emotions and low levels of negative emotions (Diener, Oishi, & Lucas, 2009). SWB is strongly linked to the FFM personality traits, most notably to Neuroticism and Extraversion, but also to Agreeableness and Conscientiousness (DeNeve & Cooper, 1998; Steel, Schmidt, & Shultz, 2008). On closer inspection, SWB has the strongest associations with two specific personality facet scales – N3: Depression (a facet of Neuroticism) and E6: Positive Emotions/Cheerfulness (a facet of Extraversion) (Dobewall, Realo, Allik, Esko, & Metspalu, 2013; Schimmack, Oishi, Furr, & Funder, 2004). Studies suggest that SWB is linked to personality traits by common genes (Weiss, Bates, & Luciano, 2008) and that SWB and personality traits reciprocally influence each other over time (Soto, 2015). However, certain life events and circumstances can also have a strong effect on SWB, some of them, such as divorce, death of a spouse, and disability, being associated with lasting changes in SWB, especially in cognitive well-being (Luhmann, Hofmann, Eid, & Lucas, 2012). Thus, it is believed that although personality and/or genetic factors can influence levels of SWB, happiness levels do change and situations and life circumstances can have a considerable influence on SWB (Diener, 2013; Lucas & Diener, 2009).

SWB has, in many studies, also been found to be associated with physical (not to mention mental) health (see Friedman & Kern, 2014, for a review). However, this association seems to be much stronger when self-reported measures of health are used (George & Landerman, 1984;

Okun, Stock, Haring, & Witter, 1984) and weakens significantly when some indicators of objective health status, such as clinically verified health data or objectively measured health indicators, are examined (Angner, Ray, Saag, & Allison, 2009; Brief, Butcher, George, & Link, 1993; Okun & George, 1984; Realo, Johannson, & Schmidt, 2015; Watten, Vassend, Myhrer, & Syversen, 1997). Thus, happy people consistently report themselves to be healthier than those who are not so happy (Lyubomirsky, King, & Diener, 2005). Like personality traits, SWB might have some real health consequences as well. A growing body of evidence indicates that SWB causally contributes to health, with initial levels of SWB predicting important health outcomes in later life (Chida & Steptoe, 2008; Diener & Chan, 2011). Yet, the causal role of SWB in health is far from fully understood (Friedman & Kern, 2014). Despite several prospective longitudinal studies that have shown that various types of SWB predict health and longevity, it is still possible that there is a third variable that influences both SWB and health and creates a 'false causal' association between them. Moreover, it cannot be excluded that it is in fact SRH that causally contributes to SWB (Gana et al., 2013; Realo et al., 2015) or that health and SWB are reciprocally related and influence each other over the life course.

Although several aspects of the association between SWB and health deserve closer examination, it is quite certain that SWB and SRH are substantially associated with each other, whatever the direction of causality. Considering the strong associations between SWB and both personality traits and SRH as well as with health-related quality of life – in the health literature, life satisfaction and happiness are often seen as important components of health-related quality of life (Romero, Vivas-Consuelo, & Alvis-Guzman, 2013) – it is important to include SWB in the analysis when examining the association between SRH and personality traits. To the best of

our knowledge, no previous study has examined the role of the FFM personality traits in general SRH ratings when also controlling for SWB.

The Present Study

The main aim of this study is to examine the contribution of the FFM personality traits to general SRH, while taking into account objective health indicators, health-related quality of life, and SWB. Although all of the aforementioned factors have previously been associated with SRH, the data have yet to clearly answer if personality traits explain any variance in SRH ratings over and above objective health indicators and people's evaluation of their quality of life (both in terms of more specific health issues as well as general SWB). Several studies that have examined and found associations between SRH and personality (e.g., Aiken-Morgan et al., 2014) have neglected other important health-related variables, which may result in inadequate controlling of confounding effects. Knowing that health risk and protective factors do not occur in isolation but rather group together (Friedman & Kern, 2014), it seems most useful to focus on clusters of predictors and to analyse the factor of interest in the context of the others.

Our study goes beyond earlier research on the topic (e.g., Löckenhoff et al., 2008) in several important aspects. First, we used more objective indicators of health status, such as the number of clinical diagnoses based on the records of the national health insurance fund and biometric measurements of blood pressure and body mass index. Much of the previous research on the association between SRH and personality traits (Löckenhoff et al., 2008) or SWB (Spuling et al., 2015) has relied on self-reports of medical conditions or hospital stays. This is problematic because it might lead to self-reports of illness, personality, and SWB that follow similar patterns (Diener & Chan, 2011) due to common-method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Second, in addition to self-reports of personality traits and SWB, we also used

informant-reports by knowledgeable others to minimize common-method bias and thereby increase both the reliability and validity of our findings (see Chang, Connelly, & Geeza, 2012, for a review). Third, differently from several previous studies that have used unrepresentative samples consisting only of older adults (e.g., Jerram & Coleman, 1999; Segerstrom, 2014) or specific patient groups (e.g., pregnant women; Christian, Iams, Porter, & Leblebicioglu, 2013), we analysed a large adult sample, which allows us not only to generalize our findings to the general population but also to examine whether personality plays a different role in predicting SRH in different age groups: earlier studies suggest that the effect of personality traits on SRH appear to grow more pronounced in older age (Duberstein et al., 2003; Spuling et al., 2015). And fourth, when examining the relative contribution of the FFM personality traits to general SRH, not only did we control for objective heath status, but also for SWB, which, as we argued above, is strongly associated not only with SRH, but also with personality traits and health-related quality of life, which reflects how people perceive the severity of their physical health problems and the extent to which their life is hampered by pain and psychological distress.

In sum, the added value of our contribution is examining the relative importance of personality traits in general SRH in the context of physical health and subjective evaluations of one's life, combining a population-based dataset with a multi-method assessment of health (including verified clinical diagnoses and objectively measured health indicators) as well as personality traits and SWB (self-reports versus informant-reports). Based on previous research that has demonstrated the importance of age, gender, and education level in SRH (McCullough & Laurenceau, 2004; Mirowsky & Ross, 2008; Spuling et al., 2015) and personality judgments (e.g., McCrae et al., 2004; Schmitt, Realo, Voracek, & Allik, 2008), we also adjust our analyses for these demographic variables. In order to examine whether the role of personality traits in

predicting general SRH becomes more or less important with age, we will also conduct regression analyses separately in two age groups.

Method

Sample

The sample was drawn from the Estonian Biobank cohort (approximately 52,000 individuals), which is a volunteer-based sample of the Estonian adult population (see Leitsalu et al., 2014, for a cohort profile). Participants were recruited by general practitioners and medical personnel or in the recruitment offices of the Estonian Genome Centre of the University of Tartu. Each participant provided informed consent (available at www.biobank.ee) and physicians performed a standardized health examination of participants. Participants also donated blood samples and completed a Computer Assisted Personal Interview (CAPI) on health-related topics and various clinical diagnoses described in the WHO ICD-10 (Leitsalu et al., 2014). A part of the Estonian Biobank cohort has been followed up longitudinally but the data we are reporting in this paper are cross-sectional in nature.

A small subset of the EGCUT participants (about 7 per cent) were also asked to complete a personality inventory. As a result, the sample for the current study consists of 1,369 individuals (61% women, n = 831) who in addition to the abovementioned measurements also (a) volunteered to complete a personality inventory and (b) for whom both personality and available health data were collected over a period of 12 months. The mean age of the sample was 51.8 years (SD = 16.3, ranging from 18 to 91). Altogether, 39% (n = 532) of the sample had a tertiary university education, about 30% (n = 412) had a secondary vocational education, 22% (n = 307) of the participants had a secondary education, and 9% (n = 118) had a basic education (see also Table S1 in Supplementary Information (SI) for sample characteristics).

Materials

General self-rated health. General SRH was measured by a single item ("How would you rate your general health status?"). This item was assessed on a 5-point scale, where 1 indicated "very good" health and 5 indicated "very bad" health. (See Table S1 in SI for the frequencies of each of the five response categories).

Personality. Personality traits were measured by the Estonian version of the NEO Personality Inventory-3 (NEO PI-3; McCrae, Costa, & Martin, 2005). The NEO PI-3 is a slightly modified version of the NEO PI-R questionnaire (Costa & McCrae, 1992; Kallasmaa, Allik, Realo, & McCrae, 2000). The NEO PI-3 consists of 240 items that measure five broad factors – Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness – and their 30 facets. Each facet is measured by 8 items, and items are answered on a 5-point Likert-like scale, ranging from 0 *(strongly disagree)* to 4 *(strongly agree).* For each individual, both self- and informant-reports were available. Self- and informant-reports of the NEO-PI-3 personality traits correlated with each other in the expected magnitude: Pearson *r*s were .53 for Neuroticism, .65 for Extraversion, .62 for Openness to Experience, .47 for Agreeableness, and .51 for Conscientiousness (ps < .001). We analysed the relative role of personality traits in general SRH at the level of broad personality dimensions as well as of the 30 intra-domain facet scales, which were designed to capture more specific aspects of the broader domains. (Please see Table S2 in SI for the mean scores of the NEO PI-3 five domain scales across self- and informant-reports).

SWB. SWB was, in this study, assessed by two items – "All things considered, how satisfied are you with your life as a whole?" and "All things considered, how happy would you say you are?" – which were measured on a scale from 0 ('extremely dissatisfied/unhappy') to 10

('extremely satisfied/happy'). For both of these items, there were also informant-ratings available. The correlations between the happiness and life satisfaction items were $r = .78$ and .77 ($p < .001$) for self- and informant-reports, respectively, indicating a similar interpretation of the two questions by the respondents. Therefore, following both the theoretical and empirical considerations (Dobewall et al., 2013), we summed up both self- and other-reported happiness and life-satisfaction variables to two single mean SWB indices: self-reported SWB ($M = 6.84$; $SD = 1.58$) and other-reported SWB ($M = 6.64$, $SD = 1.61$). The self-other agreement on SWB variables was $r = .53$ ($p = .000$), which is in the same range as found in several previous studies (Schneider & Schimmack, 2009).

Objective health indicators. All measures of current health status were retrieved from the EGCUT, which contains data gathered from the databases of health care institutions and registries, as well as from the information provided by the participant, using the abovementioned CAPI. Biometrical parameters (blood pressure, height, and weight) were measured by EGCUT recruiters (Leitsalu et al., 2014).

Clinical diagnoses. Data about the number of clinical diagnoses were received from the Estonian Health Insurance Fund (EHIF), which covers the costs of health services required by eligible persons in the case of illness, and is the only organization in Estonia dealing with compulsory health insurance (https://www.haigekassa.ee/en). For each participant, the number of diagnoses recorded in one year was used. The number of participant clinical diagnoses within a specific year ranged from 0 to 24 ($M = 4.90$, $SD = 4.33$).

Medication use. Participants reported all medications they had regularly used for specific clinically diagnosed diseases during the previous two months. In the CAPI, participants were first asked which diseases they had been diagnosed with and which medications they had used

during the previous two months in connection with these illnesses. Although medication use was reported by the participants during the CAPI, we treated this as one of the indicators of objective health for two reasons. First, previous research has shown that patient self-reports of recent medication use are reliable, and there is high congruence between self-report and drug analysis from blood samples and pharmacy records (Glintborg, Hillestrøm, Olsen, Dalhoff, & Poulsen, 2007). And second, in the present data, there was a relatively strong association between self-reported recent medication use and number of clinical diagnoses in the records of the national health insurance fund (the Spearman's *rho* correlation coefficient was .59, $p < .001$). The number of medications recently used for treating specific diseases ranged from 0 to 20 ($M = 1.92$, $SD = 2.52$).

Blood pressure. Systolic and diastolic blood pressure (BP) was measured in a sitting position at the end of the 1-2-hour-long CAPI interview. Systolic BP ranged from 80 to 204 ($M = 133.13$, $SD = 19.67$), and diastolic BP ranged from 50 to 120 ($M = 82.45$, $SD = 11.16$). Systolic and diastolic BP were strongly correlated ($r = .71$, $p < .001$). In order to avoid collinearity, only systolic BP was used in later analyses. The preference of systolic BP over diastolic BP was based on earlier research in which readings of systolic and diastolic BP have been compared, and where systolic BP has been a better predictor of cardiovascular risk (Strandberg & Pitkala, 2003).

BMI. BMI was calculated on the basis of objectively measured weight and height as weight/height^2 (kg/m^2). The values of BMI ranged from 16.86 to 52.77 ($M = 27.38$, $SD = 5.55$).

Health-Related Quality of Life. Finally, the health-related quality of life was measured by the Estonian version of the EQ-5D questionnaire (Brazier, Jones, & Kind, 1993), developed by the EuroQoL Group. It is a measure of self-reported health outcomes that is applicable to a wide

range of health conditions and treatments. It is a disease non-specific instrument and consists of five health dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression). Each of the five dimensions was rated on a 3-point scale ('1' indicating no problems, '2' indicating some problems, and '3' indicating severe problems). The mean score of the EQ-5D was 3.46 (*SD* = 0.84) – calculated as the sum of the five items divided by five – with higher scores indicating more health-related problems. The Cronbach alpha of the EQ-5D score was .76.

Results

Preliminary Data Analysis

Objective Health Indicators. An exploratory factor analysis of the four objective health indicators (i.e., number of diseases, number of medications, systolic blood pressure, and BMI) showed that the indicators clearly grouped into a single factor with factor loadings ranging from .54 to .82 (please see Table S1 for the frequencies of each of the response categories for the abovementioned variables measuring objective health status). The single factor explained 48.38% of the variance of the scores of the four indicators. Thus, the four indicators were standardized and then combined into a single index with higher scores indicating more serious health problems. The Cronbach alpha of the new index („Objective Health Status") was .64.

Age groups. In order to examine whether the contribution of the FFM personality traits to general SRH changes with age (cf. Duberstein et al., 2003; Spuling et al., 2015), we divided our sample into two age groups: those younger than 50 years of age (*n* = 609; 61.08% women) and those who were 50 or older (*n* = 760; 60.39% women). The cutoff point was chosen on the basis of the distribution of the number of diseases across age. Broadly speaking, there was a relatively continuous increase in the number of diseases across life span, however, there was a slightly

sharper increase in the mean number of diseases between 49 (M = 3.95; SD = 4.80) and 50 (M = 5.72; SD = 4.36) years of age. As expected, the two age groups differed significantly at $p < .0001$ in terms of both objective and self-reported health with older age group having significantly lower levels of general SRH (M = 2.86; SD = 0.76), $t(1363) = 17.68$; health-related quality of life (M = 1.46; SD = 0.37), $t(1363) = 14.39$, and more objectively measured health problems (M = 0.34, SD = 0.65), $t(1363) = 24.39$ than the younger age group (M = 2.13; SD = 0.75; M = 1.21, SD = 0.24; and M = -0.42, SD = 0.47, respectively).

Socio-Demographic Differences in General SRH

Altogether, 657 individuals (48% of the total sample) reported 'good' or 'very good' SRH. Broadly speaking, this estimate is in the same range as in the latest Estonian Health Survey (2006), where 41.8% of respondents reported that their health is 'good' or 'very good' (Oja, 2008). Individuals who reported lower levels of SRH were significantly older ($r = .46$, $p < .001$) and less educated ($F(3,1365) = 36.2$, $p < .001$) compared with individuals with higher levels of SRH. Women (M = 2.49; SD = 0.85) reported better SRH than men (M = 2.60; SD = 0.82), $t = 2.44$, $p = .015$ but the difference did not reach the level of statistical significance ($p < .01$) we adopted in all our analyses (Johnson, 2013).

The Associations of SRH with Objective Health Status and Health-Related Quality of Life

As expected, individuals with lower levels of SRH had significantly more objectively measured health problems, $r = .57$, $p < .001$. More specifically, people with worse SRH had more clinical diagnoses ($r = .47$), took more medications ($r = .53$), had a higher BMI ($r = .33$), and had higher systolic and diastolic blood pressure (rs = .25 and .22), all correlations significant at $p < .001$. People with lower levels of SRH also reported a lower health-related quality of life ($r = .67$, $p < .001$).

The Associations of SRH with Personality Traits and SWB

At the level of domain scales, individuals who reported lower levels of SRH were significantly more neurotic (r = .26 and .19 for self- and informant-reports), less extraverted (r = -.31 and -.19), less open to experience (r = -.29 and -.19), and less conscientious (r = -.14 and -.10), all correlations significant at $p < .001$. Finally, individuals with better SRH also had significantly higher levels of SWB, r = -.38 and -.26 for self- and informant-reports, respectively ($p < .001$).

The Contribution of Personality Traits to the Prediction of General SRH

Next, we conducted hierarchical linear regression analyses, using IBM Statistical Package for Social Sciences (IBM SPSS version 23), in order to find out whether the associations between general SRH and personality remained significant after controlling for socio-demographic variables, indicators of objective health, health-related quality of life, and SWB. Altogether, four blocks of variables were added as predictors of good SRH to the regression model: (1) participant demographics (thus, all subsequent blocks were adjusted for age, sex, and educational level); (2) FFM personality traits; (3) objective health status (a combined index of the number of clinical diagnoses and medications, BMI, and systolic blood pressure) and health-related quality of life (EQ-5D); and (4) SWB. (For correlations between the independent variables, see Table S3 in the SI). All variables within a block were, as a rule, entered simultaneously. For each block, adjusted R^2 and F-statistics are provided. Standardized regression coefficients (β) and t-test statistics for the variables in the hierarchical regression analyses are presented in Table 1 (self-reports of personality and SWB) and Table 2 (informant-reports of personality and SWB).

The contribution of personality traits was first examined at the level of the five broad dimensions for the whole sample, separately for self- and informant-reports of personality. Secondly, separate regression analyses were performed in two age groups (younger than 50 years vs 50 years and older), again using either self- and informant-reports of personality and SWB. Thus, a total of 11 variables were included in the final regression model including three sociodemographic variables (i.e., age, gender, education), the five NEO PI-3 domain scales, the index of objective health status, the index of health-related quality of life (EQ-5D), and SWB.

Insert Tables 1 and 2 about here

The Contribution of Personality Traits to SRH: Domain Scales

Self-reports of personality and SWB. Results from the regression model without personality traits showed that demographic control variables (i.e., age, gender, and education) explained 23.8% of the variance in the SRH scores. When the self-reported five NEO PI-3 domain scales were added as Block 2 to the regression model, the adjusted R^2 was increased by 8.8% compared to Block 1 whereas only one of the five personality traits, self-reported Neuroticism ($\beta = .27$, $t = 10.02$, $p < .0001$), was significantly associated with SRH. When all other blocks of variables were added to the regression model, self-reported Neuroticism remained a significant predictor of SRH at $p < .005$. Sociodemographics, objective health status, personality traits, health-related quality of life, and self-reported SWB altogether explained about 56.1% of the variance in SRH (see the results of Block 4 in Table 1). Lower levels of SRH were significantly and associated with being older ($\beta = .14$), more neurotic ($\beta = .07$), having more objectively measured health problems ($\beta = .20$), having lower levels of health-related quality of life ($\beta = .42$) and lower SWB

(β = -.16), all effects significant at $p < .0001$, except for Neuroticism, which was significant at $p < .005$.

Informant-reports of personality and SWB. In case of informant-rated personality traits, the adjusted R^2 was increased only by 3.4% compared to Block 1 (i.e., sociodemographics) when the five broad domains of personality were added as Block 2 to the linear hierarchical regression model. Similarly to self-reports, only informant-reported Neuroticism (β = .19, $t = 6.36$, $p < .0001$) was significantly associated with SRH when controlled for age, sex, and education. When all other blocks of variables were added to the regression model, informant-reported Neuroticism remained a significant predictor of SRH at $p < .0001$ until informant-reported SWB was added to the model as the last block of variables. All eleven variables explained 53.6% of the variance in SRH (see the results of Block 4 in Table 2). Lower levels of SRH were significantly associated with being older (β = .14), being male (β = -.05), having lower levels of education (β = -.05), having more objectively measured health problems (β = .21), as well as having lower levels of health-related quality of life (β = .47) and informant-reported SWB (β = -.11), all effects significant at $p < .001$, except for gender and education which were significant at $p < .01$.[1]

The Age-related Change of Predictors for SRH

Next we conducted separate hierarchical linear regression analyses in the two age groups (’younger than 50 years’ and ’50 years and older’) using either self- or informant-reports of personality and SWB.

Younger age-group (< 50 years). In the younger age group, sociodemographics, objective health status, self-reported personality traits, health-related quality of life, and self-reported SWB altogether explained 44.8% of the variance in SRH. Similarly to the findings we obtained for the whole sample, self-reported Neuroticism remained a significant predictor of SRH at $p < .01$

when all other blocks of variables were added to the regression model. More specifically, lower levels of SRH were significantly associated with having higher levels of self-reported Neuroticism ($\beta = .11$, $t = 2.61$), having more objectively measured health problems ($\beta = .15$, $t = 4.31$), having lower levels of health-related quality of life ($\beta = .44$, $t = 12.75$) and lower self-reported SWB ($\beta = -.16$, $t = -4.24$), all effects significant at $p < .0001$, except for Neuroticism, which was significant at $p < .009$.

When we repeated the same analysis using informant-reports of personality and SWB, all 11 variables explained 41.3% of the variance in SRH with lower levels of SRH being significantly associated with having more objectively measured health problems ($\beta = .17$, $t = 4.53$), having lower levels of health-related quality of life ($\beta = .48$, $t = 13.60$) and having lower informant-reported SWB ($\beta = -.12$, $t = -3.31$), all effects significant at $p < .0001$, except for SWB, which was significant at $p < .001$.

None of the sociodemographic variables made a significant contribution to the prediction of SRH in the younger age group when either self- or informant-reported personality and SWB scores were used.

Older age-group (50 years and older). In the older age group**,** sociodemographics, objective health status, self-reported personality traits, health-related quality of life, and self-reported SWB altogether explained 48.4% of the variance in SRH scores. Differently from the whole sample and from the younger age group, self-reported Neuroticism was no longer a significant predictor of SRH in the older age group when all other blocks of variables were added to the regression model. In the older age group, lower levels of SRH were significantly associated with having more objectively measured health problems ($\beta = .22$, $t = 7.01$), having

lower levels of health-related quality of life (β = .45, *t* = 14.04) and lower self-reported SWB (β = -.19, *t* = -6.18), all effects significant at *p* < .0001.

In case of informant-reports, all variables in the model explained 45.4% of the variance in SRH with objectively measured health status (β = .22, *t* = 6.67), health-related quality of life (β = .50, *t* = 16.03) and informant-reported SWB (β = -.11, *t* = -3.28) being significant predictors of SRH in the final model (all effects significant at p < .0001).

In sum, our findings showed that self-reported Neuroticism was related with lower levels of SRH only in the younger age group (i.e., younger than 50 years). Our results also suggest that objectively measured health status, health-related quality of life, and SWB appear to be invariant predictors of SRH, both across age and the method of measurement (self- vs informant-reports) whereas sociodemographic variables (most notably age but also gender and education) are only relevant when the whole sample with a broader age range was examined.

The Contribution of Personality Traits to SRH: Facet Scales

Due to the fact that none of the facet scales made a significant contribution to the prediction of SRH over and above demographic variables, objective health indicators, health related quality of life, and SWB both in self- and informant-reports, we did not proceed with the regression analyses in two separate age groups.

Discussion

Even though often assessed by a single simple question (e.g., “How would you rate your general health status?”), SRH is a complex construct – it is at once a subjective and contextual self-assessment, and an indicator of objective somatic and mental state (Jylhä, 2009). SRH reports have been widely used by both practitioners and researchers, but there are still some unanswered questions about what constitutes SRH and which factors most importantly influence

these ratings. Prior research has demonstrated the solid role of various health and healthcare factors, as well as socioeconomic indicators, in SRH. The integral role of personality – a characteristic way of thinking, feeling, and behaving – has also often been assumed, but still not yet convincingly demonstrated.

The primary goal of the present study was to examine the relative contribution of FFM personality traits to general SRH, while taking into account several objective health indicators, and health-related quality of life, as well as SWB. In addition to controlling for different health-relevant variables, the present study had several other strengths. Namely, we used data from a large population-based dataset and had access to different sources of information in addition to traditional self-report questionnaires – official treatment records from the national health insurance fund, objectively measured biometrical parameters (the height, weight, and blood pressure of participants), and informant-reports of personality traits and SWB. While health-personality studies have commonly relied on self-reports of personality traits, medical diagnoses and chronic conditions in these studies have also often been reported by participants themselves (e.g., Sirola et al., 2010). This may cause biases and inaccuracies in terms of validity, not to mention common-method variance issues (Podsakoff et al., 2003). Clearly, if not only SRH but also other health variables are all based on self-reports, these are likely to be modified by the same evaluation framework—for instance, by the same optimistic or pessimistic disposition (Jylhä, 2009), and in this way, finding a strong link between SRH and personality traits should not be surprising.

The results of the present study, which employed a sophisticated approach to measuring the contribution of personality traits to SRH, demonstrated that sociodemographics (most notably age but also education), indicators of objective health status, health-related quality of life,

personality traits and SWB altogether explained from 53.6% to 56.1% of the variance in SRH in the whole sample when self- vs informant-reports of personality and SWB were used. However, differently from previous studies (e.g., Löckenhoff et al., 2008), the FFM personality traits made a relatively modest contribution to the prediction of SRH over and above the previously mentioned variables: only higher self-reported Neuroticism was significantly associated with lower levels of SRH (at $p < .01$) over and above demographic variables, objective health indicators, health related quality of life, and SWB. This effect, however, was not replicated when using the informant-ratings of personality. Thus, regardless of using either self- or informant-rated personality and SWB, the strongest predictors of lower levels of general SRH in our study were people's lower evaluations of their health-related quality of life (EQ-5D), lower level of objective health status (as measured by their BMI, blood pressure, number of diseases and number of medications), lower levels of SWB and higher age.

How can the modest role of personality traits in general SRH assessment be explained? Our findings seem to support the second pathway as proposed by Löckenhoff and colleagues (2008), according to which personality traits do not have a strong direct impact on SRH but influence it through shaping people's subjective interpretations of their objective health status and life in general. More specifically, our findings suggest that the effect of Neuroticism on SRH may be mediated by SWB. The strong associations between personality traits, especially Neuroticism and Extraversion, and SWB are well documented (Steel et al., 2008), yet researchers suggest that SWB and personality should be treated as separate constructs because SWB has not only a stable trait-like component but also a more variable, occasion-specific state-like component (Kaczmarek, Bujacz, & Eid, 2015). In the present study, SWB was one of the most significant predictors of SRH, even when other objective health and health-related quality of life indicators

were taken into account. The strong association between general SRH and SWB was expected, considering that these two constructs have something very important in common. Namely, in addition to being subjective and contextual self-evaluations, both SRH and SWB have been shown to predict longevity and morbidity beyond objectively measured physical health (Chida & Steptoe, 2008; DeSalvo et al., 2006; Friedman & Kern, 2014; Siahpush, Spittal, & Singh, 2008). So, it is plausible that personality traits (most notably Neuroticism) affect SRH via SWB, which, on the one hand, is rooted in biological dispositions (being linked with personality by common genes, cf. Weiss et al., 2008), but, on the other hand, also takes into account people's aspirations, life events, daily activities, and even cultural-sociopolitical circumstances (Diener, 2009). This view is supported by earlier findings that have shown that although SRH is moderately heritable (Romeis et al., 2000; Silventoinen, Posthuma, Lahelma, Rose, & Kaprio, 2007), there are no specific genetic effects on SRH (Mosing et al., 2010) but rather that „genetic influences on SRH are mediated through genetic influences affecting chronic diseases, functional limitation, and mood" (Leinonen et al., 2005, p. 1002). Thus, our findings seem to indicate that a simple personality-to-poor-health model is most probably incomplete and personality interactions with life events also matter (Friedman & Kern, 2014). One should bear in mind, though, that we employed a cross-sectional design in our study and therefore, we cannot conclude anything about the causality of the associations between general SRH and SWB and it may well be that it is in fact the better subjective health status that contributes to higher levels of SWB, not the other way around (Gana et al., 2013; Realo et al., 2015).

However, there could be some alternative explanations for our findings – such as the sample composition. Namely, while much of the past research on personality and SRH has specifically focused on older adults (except for Löckenhoff, Terraciano, Ferrucci, & Costa, 2012, who

analyzed a large sample consisting of different birth cohorts and age groups), our study employed a population-based sample and examined individuals from young adults to the oldest old. This might have had a significant effect on the outcome, because there is considerable reason to believe that the predictors of SRH might be somewhat different across age groups. Namely, earlier studies suggest that the associations of SRH with personality traits, positive affect, and depressive symptoms increase with age (Benyamini et al., 2000; Duberstein et al., 2003; Spuling et al., 2015) whereas the association between physical functioning and SRH tends to decrease with age, as impairments and functional limitations become more common and even expected (Spuling et al., 2015). Our findings, however, suggest that the importance of objectively measured (mostly physical) health problems, health-related quality of life, and SWB for general SRH is relatively stable/invariant across the examined age range. Our finding is in line with earlier studies that have shown that physical health remains a major determinant of SRH across life span whereas the other sociodemographic factors contribute less to SRH (Manderbacka, Lundberg, & Martikainen, 1999; Singh-Manoux et al., 2006). As for our finding that the self-reported Neuroticism was a significant predictor of general SRH only in the younger (younger than 50 years) but not in the older (50 and older) age group, we propose that this can be explained in the light of a recent study by Spuling and colleagues (2015) who showed that emotional factors were more important for SRH in later-born cohorts than in earlier-born cohorts. Again, since our study was cross-sectional in nature, we cannot distinguish between age and cohort effects and therefore, it might well be that the association between self-reported Neuroticism and general SRH in the younger age group reflects a cohort, and not an age-effect (cf. Realo & Dobewall, 2011).

Limitations and Conclusions

The findings from this study should be considered in the context of certain limitations, some of which such as the cross-sectional design of our study were already mentioned above. Among other limitations, there are several issues related to the specific objective health indicators used in the current study. First, we examined the number of current clinical diagnoses (which was retrieved from the records of the national health insurance fund), but this data did not include information about which organ domains were impaired nor could we take into account disease severity. This is potentially problematic, as a simple disease count as a measure of multi-morbidity has a weak correlation with subjective health (Fortin, Dubois, Hudon, Soubhi, & Almirall, 2007). Fortin and colleagues (2007) showed that, in addition to the effects of single diseases, the combinations of specific diseases can also be relevant. For instance, a respiratory-cardiac combination is of particular concern because of a synergistic negative effect on health-related quality of life (Fortin et al., 2007).

As a second limitation, it should be noted that medication use, which was treated as an objective indicator of physical health status in the present study, was self-reported by the participant during the CAPI. This might have elevated the association between SRH and medication use because it is possible that individuals who think that their health is bad are also more knowledgeable about the medications they are taking and more inclined to remember and report every one of these. Nevertheless, we do not believe that self-reported medication use significantly influenced the present results because individuals' self-reports of recent medication use have been shown to be reliable (Glintborg et al., 2007). Another extenuating factor is the strong association that we found between self-reported medication use and the objective number of clinical diagnoses obtained from the national health insurance fund. That is, the number of

medications taken can be considered a relatively good index of the complexity of an individual's health status, including comorbidities, as multiple medications are often required to manage clinically complex health conditions (Boyd et al., 2005). We also hope that by combining different indicators of objective health (i.e., number of diseases, number of medications, BMI, and systolic blood pressure) into a single coherent index, we were able to overcome most of the problems mentioned above.

We would also like to stress that, although it is important to include objectively measured parameters in the study of SRH, the findings of this study coincide with the notion of Jylhä (2009): it is hard to overestimate the relevance of subjective experiences and interpretations in SRH judgment, knowing that various symptoms and sensations, such as pains, aches, and low spirits, are signals from the individual's body and mind that are indeed directly available only to the person him- or herself. Objective clinical or physiological states can only be taken into account in SRH if they are known to the individual, directly or indirectly (Jylhä, 2009).

In sum, what is needed to report being in good health? Our results suggest that regardless of age and gender, people seem to base their ratings of general SRH on their objectively measured health status, be it medical diagnoses, prescribed drugs, BMI, and/or blood pressure. At the same time, it is not only the relative absence of disease and medication burden that contributes to the better SRH but also being happier and more satisfied with life in general. Even more importantly, it is the people's interpretation of the effects of their mental and physical health problems on their everyday behaviours and functional status which has the most significant effect on the individual's general health evaluation. Thus, general SRH has both objective ("true health status") and subjective ("evaluation of one's health-related quality of life and well-being") components which interplay in forming people's general health evaluations (Altman, Van Hook,

& Hillemeier, 2016). Personality traits – which were the main focus of the current study – seem to matter less in general SRH ratings with their effects (most notably of Neuroticism) being mostly accounted by differences in people's age, gender, and levels of SWB.

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Preparation of this manuscript was supported by the University of Tartu (SP1GVARENG) and by institutional research funding (IUT2-13) from the Estonian Ministry of Education and Science to Jüri Allik. Anu Realo was a Visiting Professor at the Health, Medical, and Neuropsychology Department at the Faculty of Social and Behavioural Sciences at Leiden University during the writing of this article. She was supported by a grant from the Netherlands Institute for Advanced Study (NIAS) during the preparation of the first draft of this article. We thank Karin Täht and Delaney Michael Skerrett for their helpful comments on earlier drafts of this article.

This research was approved by the Research Ethics Committee of the University of Tartu (approvals: 236/M-29, 14 May 2014; 206/T-4, 22 Aug 2011; 170/T-38, 28 April 2008; 166/T-21, 17 Dec 2007).

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Table 1

Hierarchical Linear Regressions Examining the Influence of the NEO PI-3 Personality Domains (Self-Reports) on General Self-Rated Health (SRH) after Controlling for Sociodemographic Variables, Objective Health Indicators, Health-Related Quality of Life, and Subjective Well-Being (Self-Reports)

		Block 1			**Block 2**			**Block 3**			**Block 4**		
		β	*t*	*p*	*β*	*t*	*p*	*β*	*t*	*p*	*β*	*t*	*p*
Sociodemographics													
Age		.43	18.00	.000	.43	17.13	.000	.15	5.77	.000	.14	5.75	.000
Gender		-.03	-1.47	.142	-.06	-2.47	.014	-.05	-2.56	.011	-.05	-2.43	.015
Education		-.16	-6.64	.000	-.11	-4.91	.000	-.05	-2.57	.010	-.03	-1.67	.094
Adjusted R^2	*.238*												
Block's F	142.59^{***}												
NEO PI-3													
Neuroticism					.27	10.02	.000	.11	4.66	.000	.07	2.84	.005
Extraversion					-.03	-1.13	.258	-.05	-2.13	.034	-.02	-0.70	.486
Openness					-.06	-2.00	.046	-.02	-0.67	.506	-.01	-0.62	.539
Agreeableness					.01	0.30	.767	.02	0.56	.577	.04	1.36	.176
Conscientiousness					-.01	-0.51	.611	-.01	-0.64	.520	-.01	-0.31	.755
Adjusted R^2	*.326*												
Block's χ^2	83.29^{***}												
Objective Health and EQ-5D													
Objective Health								.20	7.62	.000	.20	8.01	.000
EQ-5D								.45	19.63	.000	.42	18.59	.000
Adjusted R^2	*.543*												
Block's F	163.15^{***}												
Subjective Well-being											-.16	-7.41	.000
Adjusted R^2	*.561*												
Block's χ^2	159.22^{***}												
Constant			16.21	.000		5.39	.000		3.67	.000		5.77	.000

Note. NEO PI-3 = NEO Personality Inventory-3; Objective Health = a combined index of the four objective health indicators (i.e., number of diseases, number of medications, systolic blood pressure, and BMI); EQ-5D = an index of health-related quality of life; SWB = subjective well-being.

Table 2

Hierarchical Linear Regressions Examining the Influence of the NEO PI-3 Personality Domains (Informant-Reports) on General Self-Rated Health (SRH) after Controlling for Sociodemographic Variables, Objective Health Indicators, Health-Related Quality of Life, and Subjective Well-Being (Informant-Reports)

		Block 1			**Block 2**			**Block 3**			**Block 4**		
		β	*t*	*p*	*B*	*t*	*p*	*β*	*t*	*p*	*β*	*t*	*p*
Sociodemographics													
Age		.43	17.99	.000	.42	17.62	.000	.14	5.70	.000	.14	5.68	.000
Gender		-.03	-1.30	.192	-.06	-2.23	.026	-.05	-2.56	.011	-.05	-2.62	.009
Education		-.16	-6.47	.000	-.13	-5.41	.000	-.06	-2.99	.003	-.05	-2.73	.006
Adjusted R^2	.237												
Block's F	141.33^{***}												
NEO PI-3													
Neuroticism					.19	6.36	.000	.07	2.64	.008	.03	1.04	.296
Extraversion					-.02	-0.70	.486	-.03	-1.31	.189	-.01	-0.53	.597
Openness					.01	0.17	.865	.01	0.56	.578	.02	0.66	.508
Agreeableness					.05	1.74	.082	.03	1.15	.249	.03	1.38	.169
Conscientiousness					-.01	-0.29	.770	.01	0.58	.561	.02	1.11	.266
Adjusted R^2	.267												
Block's χ^2	62.89^{***}												
Objective Health and EQ-5D													
Objective Health								.20	7.70	.000	.21	7.89	.000
EQ-5D								.48	21.07	.000	.47	20.66	.000
Adjusted R^2	.529												
Block's F	153.28^{***}												
Subjective Well-being											-.11	-4.79	.000
Adjusted R^2	.536												
Block's χ^2	143.71^{***}												
Constant			15.94	.000		5.21	.000		2.88	.000		4.36	.000

Note. NEO PI-3 = NEO Personality Inventory-3; Objective Health = a combined index of the four objective health indicators (i.e., number of diseases, number of medications, systolic blood pressure, and BMI); EQ-5D = an index of health-related quality of life; SWB = subjective well-being.

Supplementary Information

Table S1

Sample Characteristics and Description of Objective and Self-Reported Health Variables

	% (*n*)	Mean (*SD*)
Sociodemographics		
Age		51.79 (16.30)
Gender		
Male	39.3 (538)	
Female	60.7 (831)	
Education level		
Basic	8.6 (118)	
Secondary	22.4 (307)	
Secondary Vocational	30.1 (412)	
Tertiary (University degree)	38.9 (532)	
General Self-rated Health (SRH)		2.54 (0.84)
Very Good	10.3 (141)	
Good	37.7 (516)	
Average	40.8 (558)	
Bad	10.7 (146)	
Very bad	0.6 (8)	
Objective Health Indicators		
No. of medical diagnoses		4.90 (4.33)
No. of medications		1.92 (2.52)
Body Mass Index (BMI)		27.38 (5.55)
Systolic blood pressure		133.13 (19.67)
Diastolic blood pressure		82.45 (11.16)

Health-Related Quality of Life (EQ-5D)		3.46 (0.84)
Mobility		
No problems	72.2 (989)	
Some problems	27.5 (377)	
Extreme problems	0.2 (3)	
Self-care		
No problems	88.9 (1,217)	
Some problems	10.8 (148)	
Extreme problems	0.3 (4)	
Usual daily activities		
No problems	71.0 (972)	
Some problems	27.5 (376)	
Extreme problems	1.4 (19)	
Pain/discomfort		
No problems	44.7 (612)	
Some problems	53.0 (726)	
Extreme problems	2.2 (30)	
Anxiety/depression		
No problems	55.2 (756)	
Some problems	42.4 (580)	
Extreme problems	2.4 (33)	

Table S2

Mean Scores of the NEO PI-3 Five Domain Scales and Subjective Well-being across Self- and Informant-Reports

	Self-Reports		**Informant-Reports**				
	M	*SD*	*M*	*SD*	*t*	*p*	r_{SO}
NEO PI-3							
Neuroticism	84.70	25.09	81.87	25.62	2.92	.004	.53
Extraversion	98.19	25.57	105.46	26.30	-7.34	.000	.65
Openness	102.31	21.79	96.17	20.56	7.59	.000	.61
Agreeableness	121.84	17.52	121.87	22.90	-0.05	.964	.47
Conscientiousness	121.94	21.81	130.25	25.00	-9.26	.000	.51
Subjective Well-Being	6.84	1.58	6.64	1.61	3.26	.001	.53

Note. t = t-statistic (variables were treated as independent samples); r_{so}= self-other correlation.

Table S3

Pearson Correlation Coefficients among Age, General SRH, Objective Health Index, Health-Related Quality of Life, Subjective Well-Being (both Self- and Informant-rated), and Five-Factor Model Personality Traits (both Self- and Informant-Rated)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	-															
2. General SRH	**.46*****	-														
3. Objective Health Index	.60***	**.57*****	-													
4. EQ-5D	.38***	**.67*****	.54***	-												
5. SWB-self	-.11***	**-.38*****	-.17***	-.31***	-											
6. Neuroticism-self	-.08**	**.26*****	.10***	.28***	-.42***	-										
7. Extraversion-self	-.29***	**-.31*****	-.23***	-.24***	.38***	-.34***	-									
8. Openness-self	-.34***	**-.29*****	-.32***	-.23***	.22***	-.11***	.55***	-								
9. Agreeableness-self	.28***	**.08****	.13***	.05	.09**	-.18***	-.16***	-.09**	-							
10. Conscientiousness-self	.04	**-.14*****	-.04	-.12***	.26***	-.44***	.25***	.03	.19***	-						
11. SWB-other	-.08**	**-.26*****	-.13***	-.22***	.53***	-.30***	.27***	.14***	.04	.17***	-					
12. Neuroticism-other	.01	**.19*****	.14***	.22***	-.26***	.53***	-.19***	-.06	-.07*	-.18***	-.50***	-				
13. Extraversion-other	-.20***	**-.20*****	-.17***	-.16***	.24***	-.21***	.65***	.37***	-.07**	.12***	.35***	-.32***	-			
14. Openness-other	-.25***	**-.19*****	-.24***	-.15***	.15***	-.09**	.37***	.62***	-.01	.00	.23***	-.18***	.60***	-		
15. Agreeableness-other	.04	**-.02**	-.01	-.03	.08**	-.06*	-.07**	-.04	.47***	.03	.21***	-.35***	.02	.12***	-	
16. Conscientiousness-other	.04	**-.09****	-.06*	-.11***	.18***	-.21***	.08**	-.02	.17***	.51***	.34***	-.45***	.23***	.14***	.31***	-

Note. *** $p < .001$, ** $p < .01$, * $p < .05$, SRH = self-rated health, Objective Health Index = a combined index of the four objective health indicators (i.e., number of diseases, number of medications, systolic blood pressure, and body mass index); EQ-5D = an index of health-related quality of life; SWB = subjective well-being; self = self-reports; other = other-reports.

Footnotes

[1] We also examined the effect of 30 NEO PI-3 facet scales on the SRH. When self-reported personality traits were added as the 30 facets to the regression model in Block 2, the increase in the adjusted R^2 was 12.0% compared to Block 1 (i.e., age, gender, and education). Higher self-reported N1: Anxiety ($\beta = .14$, $t = 3.66$, $p < .0001$), lower E6: Positive Emotions ($\beta = -.09$, $t = -2.81$, $p < .005$), lower O6: Openness to Values ($\beta = -.08$, $t = -2.83$, $p < .005$), lower A1: Trust ($\beta = -.09$, $t = -3.20$, $p < .001$), and higher A5: Modesty ($\beta = .11$, $t = 3.60$, $p = .000$) were significant predictors of SRH when age, gender, and education were controlled for. However, only a single facet of the NEO PI-3, higher self-reported A5: Modesty, was significantly associated with lower levels of SRH ($\beta = .08$, $t = 3.09$, $p = .002$) over and above demographic variables, objective health indicators, health related quality of life, and SWB, with all variables explaining 56.8% of the variance in SRH. In case of informant-rated personality traits, the adjusted R^2 was increased by 4.9% compared to Block 1 (i.e., sociodemographics) when the 30 facet scales of the NEO PI-3 were added as Block 2 to the regression model. Lower other-reported E4: Activity ($\beta = -1.12$, $t = -3.13$, $p = .002$), lower A2: Straightforwardness ($\beta = -.08$, $t = -2.58$, $p = .010$) and higher A6: Tender-mindedness ($\beta = .10$, $t = 3.13$, $p = .001$) were significant predictors of lower SRH after controlling for the effects of age, gender, and education. However, none of the facet scales remained a significant predictor of SRH when other variables were added to the model in Block 3 (i.e., objective health status and EQ-5D) and Block 4 (i.e., SWB), all variables explaining 54.1% of the variance in SRH.