Subjective Well-Being among Primary Health Care Patients

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Abstract

Background: The psychological importance of subjective well-being for a healthy life has been well recognized. It is also well known that depressive and anxiety disorders have a negative effect on subjective well-being. The aim of this cross-sectional, descriptive study was to assess the subjective well-being status of a group of primary healthcare patients in relation to socio-demographic characteristics, personal health and mood-status.

Methods: A total of 284 patients participated in the study. The Oxford Happiness Scale, Life Satisfaction Scale, DASS-42 (Depression, Anxiety and Stress Scales-42) and a questionnaire about socio-demographic characteristics were completed by the participants.

Results: In general, the participants were found to be moderately happy and satisfied with their lives. They had mild levels of depression, anxiety and stress. In terms of happiness, an older age (≥40 years), educated to secondary level or higher and not having depression or anxiety were found to be factors increasing happiness. In terms of life satisfaction, female gender, an older age (≥40 years), educated to secondary level or higher, being single and not having depression were found to increase life satisfaction.

Conclusion: Primary healthcare providers should give more importance to the mood status of their patients. Screening for depression and anxiety should be applied at the primary healthcare level because negative mood status is more important than some socio-demographic characteristics in respect of unhappiness and dissatisfaction.
Introduction

Over the past 40 years, researchers have tried to define subjective well-being and explain its correlations and consequences. Subjective well-being, which is synonymous with happiness, psychological well-being or mental well-being is attracting increasing attention in the field of positive psychology [1, 2, 3, 4]. Much of what we know about subjective well-being is based on the findings of a great number of representative surveys that have asked participants to report how happy and satisfied they are with their life as a whole and with various life domains. Happiness can be described as often being in a state of joy, or as a state of satisfaction. Being in a state of joy is an emotion and being satisfied is cognition. Measures of subjective well-being emphasize both emotions and cognitions.

In previous studies, many variables have been shown to be related to subjective well-being. In respect of socio-demographic characteristics for example, education, wealth and being married have been determined to be positively related to happiness whereas age has been found to be related to satisfaction but not to happiness because older people experience emotions less intensely than younger people [3, 5]. Among the many factors which affect subjective well-being and happiness, being healthy is also important. On the other hand, many studies have shown that subjective well-being protects individuals from both physical and psychological disorders. Studies have shown that happiness appears to foster physical health and high optimism prevents cardio-vascular diseases and death [6, 7, 8, 9]. Optimism and positive emotions have also been linked to faster recovery rates and to a greater adherence to the medical regimen [10, 11]. Thus subjective well-being may act as a preventive factor [12, 13, 14, 15]. Happiness and life satisfaction predicted lower risk of all-cause mortality in healthy populations [16]. Furthermore life satisfaction, absence of negative emotions, optimism, and positive emotions have been reported to result in better health and longevity [17, 18, 19].

It is also well known that depressive and anxiety disorders have a negative effect on subjective well-being. Researchers have reported that the severity of anxiety is associated with significant impairments in psychological well-being and the presence of a depressive disorder comorbid with an anxiety disorder had a negative impact on quality of life and life satisfaction [20, 21, 22]. Positive psychological interventions have been seen to decrease depression and pain among primary health care patients [23]. Mood disorder and impaired emotional and social role functioning have been found to be associated with unhappiness [24].

In Turkey, the subjective well-being of the general population and of patients is a neglected issue and studies on this subject are rare. The studies available on life satisfaction and happiness for the general population in Turkey used the data sets of the World Values Survey and World Database of Happiness [25, 26]. In these studies which were conducted on the general population, the areas of happiness and life satisfaction were assessed with only one question of: “Are you happy” or
“Are you satisfied with your life?” The results of these studies have shown discrepancies. One study found a significant negative effect of age on happiness and life satisfaction whereas the other study determined a positive significant effect [27, 28]. One study showed that being male has a significantly negative direct effect on happiness whereas the other study found that gender had no effect [27, 28]. Furthermore, one study found no significant effect of education whereas the other study revealed a significant positive relationship between education and happiness [27, 28]. Both of these studies showed a significant positive relationship between happiness, life satisfaction and higher levels of income. Compared to previous studies in Turkey, the current study is of importance because the data were collected directly from the participants. No previously collected data were used and the assessment of subjective well-being was made using validated scales.

The purpose of this study was to assess the subjective well-being status of a group of patients who attended a primary healthcare unit in Turkey. Of the many factors which have been found to be related to subjective well-being evaluations were made to assess relationships between:

1. Some socio-demographic characteristics (age, sex, education, marital status and income) and subjective well-being;
2. Having a chronic disease and subjective well-being;
3. Experiencing any kind of loss (family member, money or job) and subjective well-being;
4. Mood status (depression, anxiety, stress) and subjective well-being.

Materials and Methods

Study design

This was a cross-sectional, descriptive study which depended on self-reporting.

Ethical Issues

Approval for the study was granted by Uludag University Faculty of Medicine Ethics Committee (Date of approval: 31 July 2012; number: 2012-17/2). The study was conducted in accordance with the Declaration of Helsinki. Written informed consent forms were seen and approved by the Uludag University Faculty of Medicine Ethics Committee during the approval process of the study. All participants gave written informed consent before taking part and the informed consent forms were collected in a separate file.

Place of the study

This study was performed in a primary healthcare unit in Bursa, Turkey. This primary healthcare unit is affiliated to the medical faculty and serves as a training center for medical students and research assistants of the Family Medicine Department.
Study participants
During a period of two months, 378 adult patients (aged 18 years and over) attended this unit. All were asked to participate in the study after the necessary information about the study was given. Written informed consent was obtained from 284 patients and 94 patients did not want to participate. The response rate to the study was 75.1%.

Study materials
All of the study materials were printed materials, which were distributed to the patients who then answered the questions anonymously. The printed materials used were as follows:

1. A questionnaire about the socio-demographic characteristics of the participants such as, sex, age, marital status, educational attainment and income. Two further questions were asked on this questionnaire: “Have you been diagnosed or treated for clinical depression during the last year?” “Have you experienced any kind of loss (family member, money or job) during the last year?
2. The Turkish version of the Oxford Happiness Questionnaire (OHQ): The original scale was developed by Hills and Argyle, adapted for Turkey by Seker and Gencdogan and the psychometric analyses of the Turkish version were made by Dogan and Sapmaz [29, 30, 31]. The Turkish form of OHQ has a one-factor structure. The Cronbach alpha internal consistency coefficient of OHQ in Turkish was 0.91, the reliability coefficient obtained with test half-life method was 0.86 and the composite reliability of the scale was 0.91 [31]. The Turkish version of the OHQ is similar to the original and has 29 single items that respondents may answer on a uniform six-point Likert scale. The sum of the item scores is an overall measure of happiness, with high scores indicating greater happiness. The range of the total item scores is 29-174 points.
3. The Turkish version of the Satisfaction with Life Scale (SWL): The original scale was developed by Diener, Emmons, Larsen and Griffin, adapted for Turkish by Koker and psychometric analyses were made by Yetim [32, 33, 34]. The Cronbach alpha internal consistency coefficient of SWL in Turkish was found to be 0.76 and test re-test reliability was 0.85 [34]. The Turkish version of the SWL scale is similar to the original and has 5 single items that respondents answer on a uniform seven-point Likert scale. The sum of the item scores is an overall measure of life satisfaction, with high scores indicating greater life satisfaction. The range of the total item scores is 5-35 points.
4. Depression, Anxiety and Stress Scales-42 (DASS-42). The original scale was developed by Lovibond and Lovibond [35]. The DASS-42 is a 42-item instrument measuring current (within the past week) symptoms of depression, anxiety, and stress. Each of the three scales consists of 14 items answered using a 0-3 scale, where 0=did not apply to me at all, and...
3 = applied to me very much or most of the time (range of possible scores for each scale is 0–42). Scores considered in the normal range are 0–9 for depression, 0–7 for anxiety, and 0–14 for stress. Scores above these ranges indicate the degree of the problem from mild to extreme. Psychometric analyses of the Turkish version of DASS-42 were performed by Bilgel and Bayram [36]. The Cronbach alpha internal consistency coefficients of DASS-42 in Turkish were found to be 0.92, 0.86, and 0.88 for depression, anxiety, and stress, respectively. Construct validity measured by item-scale correlations ranged from 0.48 to 0.70 for depression, from 0.33 to 0.59 for anxiety, and from 0.43 to 0.70 for stress. DASS-42 in Turkish showed a good convergent validity and a three factor structure like the original scale.

Study statistics
The IBM SPSS Statistics 22 program was used for descriptive statistics, chi square analyses, t-tests, ANOVA, correlation and multiple regression analyses.

Results
The Cronbach alpha internal consistency coefficients of the scales for the study group were as follows: OHQ = 0.92; SWL = 0.88; DASS-42- Depression = 0.95, Anxiety = 0.92 and Stress = 0.93.

The study group consisted of 284 participants; 51.1% were female and 65.8% were aged 39 years and below. The socio-demographic characteristics of the study group are shown in Table 1.

Except for educational level, no statistically significant differences were found between male and female participants in terms of socio-demographic characteristics. Descriptive statistics for total happiness, depression, anxiety, stress and life satisfaction scores are shown in Table 2.

The study group was moderately happy and moderately satisfied with their lives. However, although mean depression and stress scores were within the normal range (0–9 for depression and 0–14 for stress) they were very close to the threshold values. Furthermore, it can be said that this study group was anxious with a mean anxiety score of 9.16 which is higher than the normal range (0–7).

Of the total participants, 46 (16.2%) reported that they had been diagnosed with clinical depression and received treatment during the last year. Furthermore, 73 (25.7%) participants reported that they had experienced the loss of a family member, money or job during the last year. Some participants had a diagnosis of a chronic disease, such as diabetes, cardio-vascular diseases, hypertension, neurological disorders or osteo-arthritis. The results of the comparison of the happiness, life satisfaction, depression and anxiety scores of the participants who had reported the above-mentioned states compared to those who had not are shown in Table 3.
Participants who were diagnosed with clinical depression in the last year had significantly lower happiness and life satisfaction scores than those without such a diagnosis. They also had significantly higher depression, anxiety and stress scores. Participants who reported any kind of loss had significantly lower life satisfaction scores, whereas happiness, depression, anxiety and stress scores did not differ from the participants without any loss. Participants with chronic disease were found to be more stressed than those without any chronic disease but no significant differences were found in terms of happiness, life satisfaction, depression and anxiety scores.

The mean OHQ, SWL scores according to the socio-demographic characteristics and mood status of the participants are shown in Table 4.

Strong significant and positive correlations were determined between happiness and life satisfaction. Correlations between happiness and depression, anxiety and

### Table 1. Socio-demographic characteristics of the study group.

|                | Female N (%) | Male N (%) | Total N (%) | \( \chi^2 \) | p   |
|----------------|--------------|------------|-------------|--------------|-----|
| AGE            |              |            |             |              |     |
| ≤39            | 96 (51.3)    | 91 (48.7)  | 187 (65.8)  | 0.017        | 0.896|
| ≥40            | 49 (50.5)    | 48 (49.5)  | 97 (34.2)   |              |     |
| MARITAL STATUS |              |            |             |              |     |
| Single         | 56 (51.4)    | 53 (48.6)  | 109 (38.4)  |              |     |
| Married        | 81 (51.6)    | 76 (48.4)  | 157 (55.3)  | 0.337        | 0.845|
| Other          | 8 (44.4)     | 10 (55.6)  | 18 (6.3)    |              |     |
| EDUCATION      |              |            |             |              |     |
| Primary        | 40 (61.5)    | 25 (38.5)  | 65 (22.9)   |              |     |
| Secondary      | 30 (38.5)    | 48 (61.5)  | 78 (27.5)   | 8.067        | 0.018|
| Higher         | 75 (53.2)    | 66 (46.8)  | 141 (49.6)  |              |     |
| INCOME (monthly, US$) | | | | | |
| ≤328           | 38 (58.5)    | 27 (41.5)  | 65 (22.9)   |              |     |
| 329–657        | 57 (50.0)    | 57 (50.0)  | 114 (40.1)  |              |     |
| 658–985        | 22 (51.2)    | 21 (48.8)  | 43 (15.1)   | 3.196        | 0.525|
| 986–1314       | 14 (51.9)    | 13 (48.1)  | 27 (9.5)    |              |     |
| ≥1315          | 14 (40.0)    | 21 (60.0)  | 35 (12.3)   |              |     |

* % within rows ** % within columns.

Table 2. Mean and median values for OHQ, SWL and DASS-42.

|               | Mean  | Median | Standard Deviation | Standard Error |
|---------------|-------|--------|--------------------|----------------|
| Oxford Happiness Scale | 116.04 | 119.00 | 22.49              | 1.33           |
| Satisfaction with Life Scale | 22.06  | 23.00  | 7.85               | 0.46           |
| DASS-42 Depression | 8.89   | 6.00   | 8.79               | 0.52           |
| DASS-42 Anxiety   | 9.16   | 8.00   | 7.98               | 0.47           |
| DASS-42 Stress    | 13.65  | 13.00  | 9.15               | 0.54           |

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stress were strong, significant and negative. Similar correlations were found for life satisfaction. Furthermore, strong and positive correlations were found between depression, anxiety and stress.

Multiple regression analyses were applied to assess the impact of socio-demographic variables, factors like having a chronic disease and experiencing any kind of loss and depression, anxiety and stress on happiness and life satisfaction (Table 5 and Table 6).

In Model A, only the socio-demographic variables were included in the analyses both for happiness and life satisfaction and these variables explained 18% and 11% of the variance in happiness and life satisfaction respectively. In Model B, factors like having a chronic disease and experiencing any kind of loss and depression, anxiety and stress scores were added to the model. Socio-demographic variables and the newly added variables together explained 56% of happiness and 40% of life satisfaction. When the results of Model B were taken into account, happiness was found to be related to age (participants ≥40 years of age were happier than those ≤39 years of age), educational level (participants with secondary and higher education were happier than those with only primary education), depression and anxiety levels (participants without depression and anxiety were happier than participants with different levels of depression and anxiety). Gender, marital status, income, having a chronic disease, experiencing any kind of loss and stress levels were not found to be related to happiness.

According to the results of Model B, life satisfaction was found to be related to gender (female participants were more satisfied than males), age (participants ≥40 years of age were more satisfied than those ≤39 years of age), educational level (participants with secondary and higher education were more satisfied than those with only primary education), marital status (single participants were more satisfied), and depression levels (participants without depression were more satisfied).
Table 4. Mean OHQ, SWL scores according to socio-demographic characteristics and mood status.

| SOCIO-DEMOGRAPHICS | OHQ Mean ± SE | SWL Mean ± SE |
|---------------------|---------------|---------------|
| GENDER              |               |               |
| Male                | 117.67 ± 1.99 | 21.69 ± 0.64  |
| Female              | 114.47 ± 1.78 | 22.41 ± 0.67  |
| Test Statistics & p value | t-test 1.20; p = 0.23 | 0.768; p = 0.44 |
| AGE                 |               |               |
| ≤39                 | 114.19 ± 1.73 | 21.39 ± 0.58  |
| ≥40                 | 119.60 ± 1.96 | 23.35 ± 0.77  |
| Test Statistics & p value | t-test 1.93; p = 0.05 | 2.00; 0.05 |
| MARITAL STATUS      |               |               |
| Single              | 118.97 ± 1.95 | 23.49 ± 0.68  |
| Married             | 116.04 ± 1.69 | 21.92 ± 0.63  |
| Other               | 98.33 ± 8.45  | 14.61 ± 1.85  |
| Test Statistics & p value | ANOVA 6.77; p = 0.001 | 10.63; p = 0.001 |
| EDUCATION           |               |               |
| Primary             | 101.07 ± 3.32 | 17.83 ± 1.19  |
| Secondary           | 118.61 ± 2.17 | 22.89 ± 0.85  |
| Higher              | 121.52 ± 1.58 | 23.55 ± 0.54  |
| Test Statistics & p value | ANOVA 21.89; p = 0.001 | 13.53; p = 0.001 |
| INCOME (Monthly US$)|               |               |
| ≤328                | 109.83 ± 3.58 | 21.57 ± 1.04  |
| 329–657             | 112.46 ± 1.78 | 20.32 ± 0.74  |
| 658–985             | 124.93 ± 2.42 | 24.91 ± 1.18  |
| 986–1314            | 119.52 ± 4.40 | 24.22 ± 1.51  |
| ≥1315               | 125.63 ± 3.40 | 23.51 ± 0.89  |
| Test Statistics & p value | ANOVA 5.75; p = 0.001 | 3.85; p = 0.005 |
| MOOD STATUS         |               |               |
| Depression          |               |               |
| None                | 126.06 ± 1.27 | 25.06 ± 0.49  |
| Mild                | 113.79 ± 2.35 | 20.95 ± 1.26  |
| Moderate            | 102.24 ± 2.32 | 18.15 ± 0.89  |
| Severe              | 95.50 ± 4.28  | 15.36 ± 2.06  |
| Extremely severe    | 69.07 ± 6.42  | 8.93 ± 0.98   |
| Test Statistics & p value | ANOVA 52.22; p = 0.001 | 32.21; p = 0.001 |
| Anxiety             |               |               |
| None                | 125.31 ± 1.55 | 24.86 ± 0.57  |
| Mild                | 120.31 ± 2.37 | 23.75 ± 1.16  |
| Moderate            | 107.35 ± 2.58 | 19.31 ± 0.88  |
| Severe              | 108.21 ± 3.48 | 19.43 ± 1.59  |
| Extremely severe    | 90.63 ± 5.49  | 14.45 ± 1.54  |
| Test Statistics & p value | ANOVA 24.52; p = 0.001 | 17.42; p = 0.001 |
| Stress              |               |               |
| None                | 125.07 ± 1.37 | 24.79 ± 0.51  |
| Mild                | 112.29 ± 2.46 | 20.56 ± 1.16  |
| Moderate            | 103.30 ± 2.86 | 18.85 ± 1.06  |
| Severe              | 93.71 ± 5.52  | 15.85 ± 1.71  |
| Extremely severe    | 90.71 ± 11.76 | 11.00 ± 1.94  |
| Test Statistics & p value | ANOVA 26.10; p = 0.001 | 18.61; p = 0.001 |

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Table 5. The effects of socio-demographic variables, and mood status on happiness.

| VARIABLES       | MODEL A |        |        |        | MODEL B |        |        |        |
|-----------------|---------|--------|--------|--------|---------|--------|--------|--------|
| Gender          | 0.022   | 0.412  | N.S.   | Gender | −0.041 | −1.023 | N.S.   |
| Age             | 0.291   | 3.982  | <0.001 | Age    | 0.201  | 3.718  | <0.001 |
| Education       | 0.336   | 5.160  | <0.001 | Education | 0.254 | 5.265  | <0.001 |
| Marital status  | −0.170  | −2.259 | <0.05  | Marital status | −0.111 | −2.009 | N.S.   |
| Income          | 0.174   | 2.959  | <0.01  | Income | 0.075  | 1.688  | N.S.   |
| Loss            | 0.048   | 1.175  | N.S.   | Chronic disease | −0.026 | −0.619 | N.S.   |
| Chronic disease | 0.001   | 0.024  | N.S.   | Depression | −0.682 | −8.626 | <0.001 |
| Anxiety         | 0.192   | 2.433  | <0.05  | Stress  | −0.128 | −1.704 | N.S.   |
| F               | 13.33   |        |        | F      | 36.42   |        |        |
| p               | <0.001  |        |        | p      | <0.001  |        |        |
| Adjusted R²     | 0.18    |        |        | Adjusted R² | 0.56  |        |        |

Table 6. The effects of socio-demographic variables, and mood status on life satisfaction

| VARIABLES       | MODEL A |        |        |        | MODEL B |        |        |        |
|-----------------|---------|--------|--------|--------|---------|--------|--------|--------|
| Gender          | −0.081  | −1.434 | N.S.   | Gender | −0.136 | −2.870 | <0.01 |
| Age             | 0.268   | 3.529  | <0.001 | Age    | 0.189  | 2.962  | <0.01 |
| Education       | 0.257   | 3.797  | <0.001 | Education | 0.187 | 3.290  | <0.01 |
| Marital status  | −0.222  | −2.841 | <0.01  | Marital status | −0.174 | −2.669 | <0.01 |
| Income          | 0.108   | 1.772  | N.S.   | Income | 0.018  | 0.349  | N.S.   |
| Loss            | −0.164  | −3.507 | <0.001 | Chronic disease | 0.001 | 0.024  | N.S.   |
| Chronic disease | 0.001   | 0.024  | N.S.   | Depression | −0.527 | −5.662 | <0.001 |
| Anxiety         | 0.116   | 1.250  | N.S.   | Stress  | −0.135 | −1.523 | N.S.   |
| F               | 8.06    |        |        | F      | 20.45   |        |        |
| p               | <0.001  |        |        | p      | <0.001  |        |        |
| Adjusted R²     | 0.11    |        |        | Adjusted R² | 0.40  |        |        |

satisfied than participants with different levels of depression). Furthermore participants who did not experience any kind of loss were more satisfied with their lives than those with such an experience. Income, anxiety stress and having a chronic disease were not found to be related to life satisfaction.


Discussion
In this study, the subjective well-being of a group of primary care patients was assessed in terms of life satisfaction and happiness. As mentioned in the Introduction, subjective well-being is an important component of being healthy and also has a strong effect on healing, therefore this issue should not be neglected in primary healthcare service. There have been several previous studies in Turkey concerning life satisfaction and happiness, most of which have been conducted on students, adolescents and the elderly [37, 38]. Studies which are representative of the Turkish general population have mostly dealt with economic issues and subjective well-being [27, 28]. In a study by Selim, the effect of age on happiness and life satisfaction was found to be negative and it was concluded that individuals in older age-groups are less happy and less satisfied than individuals in the youngest age-group (15–24 years) [27]. A similar result was reported by Haller and Hadler [39]. Another study found a positive relationship between satisfaction, happiness and age which is in line with the findings of the current study [28]. Why older people are happier and more satisfied needs to be further studied but could be explained by the experience and wisdom gained throughout life and by diminished expectations. In this study, gender was not found to be related to happiness but to life satisfaction. Female participants were significantly more satisfied than male participants. Women in Turkey have less freedom to make decisions about their way of life compared to many other countries. They are also less involved in the areas of work and public life, and have less power of decision in work organizations and politics. However, all these discriminations do not seem to reduce their life satisfaction. Some studies in the literature also found that being male had a significantly negative direct effect on happiness whereas some found no effect [40, 41, 42, 43]. A previous Turkish study found that females were happier and more satisfied than males and that result is in line with this current study [27]. According to the results of the current study, being married has no significant effect on happiness but there is an effect on life satisfaction, whereas some other studies have found that married people are both happier and more satisfied than single, divorced or widowed individuals [27, 39, 43]. A previous study from Turkey found a positive relationship between happiness and educational level which is consistent with the current study results [28]. Therefore, improving the educational level of the population should be considered a government priority with wider public health implications. No significant relationship was found between income and happiness or life satisfaction, whereas some previous studies have found a positive correlation between economic well-being and happiness and life satisfaction [27, 28, 44]. Some studies in the literature showed the presence of a chronic disease is associated with subjective well-being [45] whereas in this study we did not find such an association. This may be due to several reasons. In our study group only 27.5% of participants reported the presence of a chronic disease and this amount may be not enough for revealing such an association. Furthermore we did not assess the severity of their chronic diseases or perceptions and coping mechanisms
against these diseases which may influence subjective well-being. Therefore we think that life satisfaction and happiness among primary health care patients with chronic diseases should be a concern of another study.

The current study showed that mood status has a greater impact on happiness and life satisfaction than socio-demographic characteristics like as gender, age, marital status and income. The relationship between mood status and health outcomes illustrates the need to detect mood disturbance and psychological distress in patients seen in primary health care settings. Screening is important to determine whether patients would be served by an intervention designed to improve mental and social functioning and reduce negative thoughts and mood. Several self-reported screening tools for mood status are available in Turkish, of which the most used are the Beck Depression Inventory II and the Beck Anxiety Inventory. However, the DASS-42 can be considered to be more user-friendly and practical than the other scales. Screening of mood status will enable earlier diagnosis of depression and anxiety by referring those with scores above threshold values to a psychiatrist. Just as in other diseases, primary healthcare providers can also act as gate-keepers for mood disorders. If the burden of depression is considered worldwide (depression is the 4th leading cause of disability worldwide, and is a major contributor to the global burden of diseases. Mental disorders accounted for 25.3% and 33.5% of all years lived with a disability in low- and middle-income countries, respectively) and in Turkey (major depressive and anxiety disorders are among the top five leading causes of years lived with disability), the importance of screening for mood disorders at the primary care level can be more clearly understood [46, 47]. Furthermore, patients with chronic diseases and patients who have recently experienced any kind of loss (family member, money or job) should be monitored by primary healthcare physicians carefully as they are at risk of being unhappy and dissatisfied with their lives.

At the primary healthcare level some other attempts could be made to improve happiness and life satisfaction. There are several examples of such kinds of interventions in the literature, such as the Positive Psychology Interventions (PPI), promoting resilience, optimism, or gratitude, which could be applied at the primary health care level. Skills that can improve individual resilience such as challenging beliefs, avoiding thinking traps, calming and focusing and putting things in perspective could be taught by PPIs [48, 49, 50]. The Values in Action Inventory of Strengths (VIA-IS) could also be applied at the primary healthcare level to measure the character strengths of human goodness and excellence. These strengths are known as “signature strengths”, are not bound to culture, but are perceived as natural and desirable with an energizing rather than exhausting effect on individuals [51].

Positive psychology and related interventions are relatively new concepts and unfortunately not well known in Turkey. On the other hand, studies mostly from developed Western countries have shown that these interventions have an enormous positive impact on mental well-being, happiness and life satisfaction. Primary healthcare providers have the opportunity to offer and evaluate positive psychology practices across diverse socio-demographic subgroups that currently
receive little attention. It is hoped that more studies related to life satisfaction and happiness will increase the implementation of PPIs and that through these interventions the subjective well-being of the community will be enhanced.

Conclusions
The relationship between depression and subjective well-being illustrates the need to detect mood disturbance and psychological distress in patients seen in primary health care settings. Numerous psychometric tools can be used as screening tools and general practitioners can screen to identify individuals likely to have depression. However screening cannot be used independently for the diagnosis of depression and should be followed by clinical diagnostic interview. If resources are available and procedures are in place for accurately diagnosing, treating, referring or following up patients likely to have depression screening may improve subjective well-being.

Limitations
The limitations of this study include restricted generalization as the study was performed in a single primary healthcare unit. There may also have been recall-bias or incorrect answers as the study depended on self reporting.

Supporting Information
Data S1. Data S1 in Excel format.
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Author Contributions
Conceived and designed the experiments: AO. Performed the experiments: FOD YTC. Analyzed the data: N. Bayram N. Bilgel. Contributed reagents/materials/analysis tools: AO N. Bilgel. Wrote the paper: AO N. Bilgel.

References
1. Diener E, Suh EM, Lucas RE, Smith HL (1999) Subjective well-being: three decades of progress. Psychol Bull 125(2): 276–302. doi: 10.1037/0033-2909.125.2.276
2. Seligman MEP, Csikszentmihalyi M (2000) Positive psychology. Am Psychol 55(1): 5–14. doi: 10.1037/0003-066X.55.1.5
3. Argyle M. (2001) The Psychology of Happiness, 2nd edition. London, Routledge.

4. Seligman MEP (2008) Positive health. Appl Psychol Int Rev 57(s1): 3–18. doi: 10.1111/j.1464-0597.2008.00351.x

5. Diener E, Sandvik E, Larsen RJ (1985) Age and sex effects for emotional intensity. Dev Psychol 21(3): 542–546. doi: 10.1037/0012-1649.21.3.542

6. Veenhoven R (2008) Healthy happiness: effects of happiness on physical health and the consequences for preventive health care. J Happiness Stud 9(3): 449–469. doi: 10.1007/s10902-006-9042-1

7. Giltay EJ, Geleijnse J, Zitman M, Hoekstra FG, Schouten EG (2004) Dispositional optimism and all-cause and cardio-vascular mortality in a prospective cohort of elderly Dutch men and women. Arch Gen Psychiat 61: 1126–1135. doi: 10.1001/archpsyc.61.11.1126

8. Kubzansky LD, Sparrow D, Vokonas P, Kawachi I (2001) Is the glass half empty or half full? A prospective study of optimism and coronary heart disease in the normative aging study. Psychosom Med 63(6): 910–916.

9. Kubzansky LD, Thurston R (2007) Emotional vitality and incident coronary heart disease. Arch Gen Psychiat 64: 1393–1401. doi:10.1001/archpsyc.64.12.1393

10. Leedham B, Meyerowitz BE, Muirhead J, Frist WH (1995) Positive expectations predict health after heart transplantation. Health Psychol 14 (1): 74–79. doi: 10.1037/0278-6133.14.1.74

11. Scheier MF, Matthews KA, Owens JF, Magovern GJ, Lefebvre RC, et al. (1989) Dispositional optimism and recovery from coronary artery bypass surgery: The beneficial effects on positive physical and psychological well-being. J Pers Soc Psychol 57(6): 1024–1040. doi: 10.1037/0022-3514.57.6.1024

12. Cohen S, Alper CM, Doyle WJ, Treanor JJ, Turner RB (2006) Positive emotional style predicts resistance to illness after experimental exposure to rhinovirus or Influenza A virus. Psychosom Med 68(6): 809–815. doi:10.1097/01.psy.0000245867.92364.3c

13. Ostir GV, Markides KS, Peek MK, Goodwin JS (2001) The association between emotional well-being and the incidence of stroke in older adults. Psychosom Med 63(2): 210–215.

14. Cohen S, Pressman SD (2006) Positive affect and health. Curr Dir Psychol Sci 15: 122–125. doi:10.1111/j.0963-7214.2006.00420.x

15. Maruta T, Colligan RC, Malinchoc M, Offord KP (2000) Optimists vs. pessimists: Survival rate among medical patients over a 30-year period. Mayo Clin Proc 75(2): 140–143. doi:10.4065/75.2.140

16. Chida Y, Steptoe A (2008) Positive psychological well-being and mortality: A quantitative review of prospective observational studies. Psychosom Med 70(7): 741–756. doi: 10.1097/PSY.0b013e31818105ba

17. Williams RB, Schneiderman N (2002) Resolved: Psychosocial interventions can improve clinical outcomes in organic disease (pro). Psychosom Med 64(4): 552–557.

18. Xu J, Roberts RE (2010) The power of positive emotions: It’s a matter of life or death—Subjective well-being and longevity over 28 years in a general population. Health Psychol 29(1): 9–19. doi:10.1037/a0016767

19. Diener E, Chan MY (2011) Happy people live longer: Subjective well-being contributes to health and longevity. Appl Psychol Health Well Being 3: 1–43. doi:10.1111/j.1758-0854.2010.001045.x

20. Revicki DA, Brandenburg N, Matza L, Hornbrook MC, Feeny D (2008) Health-related quality of life and utilities in primary-care patients with generalized anxiety disorder. Qual Life Res 17: 1285–1294. doi: 10.1007/s11136-008-9406-6

21. Norberg MM, Diefenbach GJ, Toln DF (2008) Quality of life and anxiety and depressive disorder comorbidity. J Anxiety Disord 22: 1516–1522. doi: 10.1016/j.janxdis.2008.03.005

22. Daig I, Herschbach P, Lehmann A, Knoll N, Oliver Decker O (2009) Gender and age differences in domain-specific life satisfaction and the impact of depressive and anxiety symptoms: a general population survey from Germany. Qual Life Res 18: 669–678. doi: 10.1007/s11136-009-9481-3

23. Lambert D, Raven LT, Moliver N, Thompson D (2014) Happiness intervention decreases pain and depression, boosts happiness among primary care patients. Prim Health Care Res Dev first view article (22 January 2014): 1–13. doi:10.1017/S146342361300056X
24. Bergsma A, ten Have M, Veenhoven R, De Graaf R (2011) Most people with mental disorders are happy: A 3-year follow-up in the Dutch general population. J Posit Psychol 6(4): 253–59. doi: 10.1080/17439760.2011.577086

25. European Values Study Group and World Values Survey Association (2006) European and World Values Surveys four-wave integrated data file, 1981–2004, v.20060423.

26. Veenhoven R (2012) Happiness in Turkey (TR). World Database of Happiness website. Available: http://worlddatabaseofhappiness.eur.nl Accessed 2014 Jan 25.

27. Selim S (2008) Life satisfaction and happiness in Turkey. Soc Indic Res 88(3): 531–562. doi: 10.1007/s11205-007-9218-z

28. Dumludag D (2013) Life satisfaction and income comparison effects in Turkey. Soc Indic Res 114(3): 1199–1210. doi: 10.1007/s11205-012-0197-3

29. Hills P, Argyle M (2002) The Oxford Happiness Questionnaire: a compact scale for the measurement of psychological well-being. Pers Individ Dif 33(7): 1073–1082. doi: 10.1016/S0191-8869(01)00213-6

30. Seker H, Gencdogan B (2006) Psikolojide ve Eğitimde Ölçme Aracı Geliştirme. Ankara: Nobel Yayın.[Book in Turkish]

31. Dogan T, Sapmaz F (2012) Oxford Multuluk Ölçeği Türkçe formunun psikometrik özelliklerinin üniversite öğrencilerinde incelenmesi [Examination of psychometric properties of the Turkish version form of the Oxford Happiness Questionnaire in university students]. Düşün Adam Psikiyatri ve Nörolojik Bilimler Dergisi 25: 297–304. doi: 10.5350/DAJPN2012250401

32. Diener E, Emmons RE, Larsen RJ, Griffin S (1985) The satisfaction with life scale. J Pers Assess 49(1): 71–75. doi:10.1207/s15327775jpa4901_13

33. Koker S (1991) Normal ve sorunlu ergenlerde yaşam doyumu düzeyinin karşılaştırılması. Yayınlanmamış yüksek lisans tezi. Ankara: Ankara Üniversitesi Sosyal Bilimler Enstitüsü.[Unpublished master thesis, Ankara University].

34. Yetim U (1993) Kısisel projelerin organizasyonu ve onurunun acısından yaşam doyu. Yayınlanmamış Doktora Tezi, Ege Üniversitesi Sosyal Bilimler Enstitüsü: İzmir.[Unpublished PhD.Thesis, Ege University]

35. Lovibond SH, Lovibond PF (1995) Manual for the Depression Anxiety Stress Scales. Sydney: Psychology Foundation.

36. Bilgel N, Bayram N (2010) Turkish Version of the Depression Anxiety Stress Scale (DASS- 42): Psychometric Properties. Noropsikiyatri Ars 47: 118–126. doi:10.4274/npa.5344

37. Beyaztas FY, Kurt G, Bolayir E (2012) Life satisfaction level of elderly people: a field study in Sivas, Turkey. J Pak Med Assoc 62: 221–225.

38. Dogan T, Sapmaz F, Tel FD, Sapmaz S, Temizel S (2012) Meaning in Life and Subjective Well-Being among Turkish University Students. Procedia - Social and Behavioral Sciences 55: 612–617. doi: 10.1016/j.sbspro.2012.09.543

39. Haller M, Hadler M (2006) How social relations and structures can produce happiness and unhappiness: an international comparative analysis. Soc Indic Res 75(2): 169–216. doi:10.1007/s11205-004-6297-y

40. Abbott P, Sapsford R (2006) Life satisfaction in post-Soviet Russia and Ukraine. J Happiness Stud 7(2): 251–287.doi: 10.1007/s10902-005-5563-2

41. Christoph B, Noll HH (2003) Subjective well-being in the European Union during the 90s. Soc Indic Res 64(3): 521–546. doi:10.1023/A:1025983431755

42. Hayo B, Seifert W (2003) Subjective economic well-being in Eastern Europe. J Econ Psychol 24(3): 329–348. doi: 10.1016/S0167-4870(02)00173-3

43. Fuentes N, Rojas M (2001) Economic theory and subjective well-being: Mexico. Soc Indic Res 53(3): 289–314. doi: 10.1023/A:1007189429153

44. Wikman A, Wardle J, Steptoe A (2011) Quality of Life and Affective Well-Being in Middle-Aged and Older People with Chronic Medical Illnesses: A Cross-Sectional Population Based Study. PLoS ONE 6(4): e18952. doi:10.1371/journal.pone.0018952
46. WHO (2012) Depression. Fact sheet No: 369. WHO website. Available: [http://www.who.int/mediacentre/factsheets/fs369/en/](http://www.who.int/mediacentre/factsheets/fs369/en/) Accessed 2014 Feb 5.

47. WHO (2013) Mental health action plan 2013–2020. Geneva: WHO.

48. Seligman MEP, Steen TA, Park N, Peterson C (2005) Positive psychology progress: Empirical validation of interventions. Am Psychol 60(5): 410–421. doi: 10.1037/0003-066X.60.5.410

49. Seligman MEP, Rashid T, Parks AC (2006) Positive psychotherapy. Am Psychol 61(8): 774–788. doi: 10.1037/0003-066X.61.8.774

50. Sin NL, Lyubomirsky S (2009) Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta-analysis. J Clin Psychol 65: 467–487. doi: 10.1002/jclp.20593

51. Kobau R, Seligman MEP, Peterson C, Diener E, Zack MM, et al. (2011) Mental health promotion in public health: perspectives and strategies from positive psychology. Am J Public Health 101: e1–e9. doi: 10.2105/AJPH.2010.300083