ORIGINAL RESEARCH

Differences in quality of life in rural and urban populations

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Abstract

Background and purpose: To examine the predictors of health related, quality of life in rural and urban populations.

Methods: Parents and grandparents of students from 20 randomly selected primary schools in urban and rural areas of Kirikkale, Turkey were questioned for health-related quality of life (HRQL) and psychological distress, using the Short Form-12 (SF-12) Health Survey and Hospital Anxiety and Depression scale (HADS), respectively, which were returned by their children.

Results: Of 13,225 parents and grandparents 12,270 returned the questionnaires, for an overall response rate of 92.7%. SF-12 physical component summary (PCS), mental component summary (MCS), and overall scores were lower in participants from rural than those from urban areas. Mean HADS overall score was higher in subjects from rural than those from urban areas (16.6 ± 6.8 vs. 14.8 ± 6.8 , $P=0.0001$). A linear regression model showed associations between SF-12 overall, PCS, and MCS scores with HAD total score after adjusting for sex, age, BMI, smoking, income, and education.

Conclusions: Quality of life scores in subjects vary between areas. Psychological distress in subjects in rural areas may account for the poorer scores of quality of life in rural areas.

Measuring health status in a population is important for the evaluation of interventions and the prediction of health and social care needs.¹ Measurement of health-related quality of life (HRQL) is an essential component in overall assessment of health status in adult subjects and understanding of the factors that determine good health is necessary for maintained function and improved HRQL.^{2,3} HRQL is a subjective health measure that can be influenced by the subject's perceptions, expectations, and interpretations about health.⁵ There may be a tendency for anxiety or recent stressful life events to influence how someone would respond to a question. Symptoms may reflect an increased awareness of physical symptoms in individuals with psychological problems.⁶ People living in rural area have shown worse subjective and objective health and functional indices.⁷ The reasons for this were not known. Social and environmental factors may contribute to the difference. To explain the difference, further analysis and investigations of social and environmental factors are needed.

It is not well known that how urban or rural place influences the quality of life. In this study we examined predictors of quality of life in rural and urban populations.

Materials and methods

Participants

This study was carried out as part of an epidemiological survey to assess the characteristics of quality of life and other diseases in Kirikkale, Turkey in 2004. Questionnaires concerning quality of life and psychological distress were distributed to students from 20 randomly selected primary schools in Kirikkale (14 schools in urban, 6 schools in rural areas). The students were asked to interview their parents and grandparents and return the completed questionnaires within a few days. All respondents signed an informed consent form, and the study was approved by the local ethics committee.

Smokers were defined as *current-smokers* and *ex-smokers*.

Assessment of health-related quality of life

The Short Form 12 Health Survey (SF-12) was used to assess health-related quality of life (HRQL). SF-12 is an abbreviated form of the SF-36 Health Survey which can be used for large scale health measurement and monitoring. It consists of 12 items, which are used to calculate summary measures for physical and mental health. Scores are constructed so that the mean for the general population is set at 50 with a standard deviation of 10. The higher the score the better the person's health and functioning was.^{8,9}

Assessment of psychological distress

Participants were asked to fill in the self-reported HAD (Hospital Anxiety and Depression scale) questionnaire for the assessment of psychological distress. The questionnaire consisted of 14 questions in which the overall severity of anxiety and depression was rated on four-point scale (0 to 3). Seven questions were related to anxiety and seven to depression.¹⁰ HADS overall score was defined as psychological distress score. The cut-off value in each score over 10

was accepted for the presence of anxiety and depression.¹⁰

Statistical Analysis

Statistical analyses were performed using a statistical software package program (SPSS for Windows, version 10.01; SPSS, Inc., Chicago, Illinois, USA). The chi-square test was used for testing differences in the prevalence of symptoms between the groups. Prevalence odds ratios (ORs) and their 95% confidence intervals (CIs) were calculated using the Mantel-Haenszel method. For comparisons of continuous variables a t-test was performed. Dummy variables were used to compare HRQL between the subjects from urban and rural areas. Multiple linear regression analysis was performed with the scores of HRQL as the dependent variable, gender (female = 0; male = 1), age, education (none = 0; primary school = 1; secondary school = 2; high school = 3) and income (> \$200 or €155 monthly = 0; < \$200 or €155 monthly = 1), body mass index (BMI) as predictor variables. Data were expressed as mean $\pm$ standard deviation. A *P* value < 0.05 was assumed to be statistically significant.

Results

Of 13,225 parents and grandparents of primary school students 12,270 returned the questionnaires, for an overall response rate of 92.7%.¹¹ However, eligible data for all analyses were obtained from 12,074 subjects.

Subjects in urban areas

Of 10,224 parents and grandparents of primary school students 9,986 returned the questionnaires, for an overall response rate of 97.7%. A total of 689 subjects were further excluded from the study because of their responses of "do not know" and/or "not sure" to the questions related to quality of life, and due to incom-

TABLE 1. Characteristics of the subjects included in the study from urban and rural Kirikkale*

Characteristics	Subjects from urban n = 9,297	Subjects from rural n = 2,293	P
Age (yr)	44.0 ± 11.6	46.5 ± 13.1	0.0001
Female n (%)	4,904 (52.7)	1,238 (54.0)	0.2
Education n (%)			
None	1,064 (11.4)	644 (28.1)	0.0001
Primary school	5,224(56.2)	1,098(47.9)	0.0001
Secondary school	2,177 (23.4)	525(22.9)	0.6
High school	832 (8.9)	26 (1.1)	0.1
Monthly income n (%)			
<\$200 or €155	7,664 (82.4)	1,772 (77.3)	0.0001
Smoking n (%)	3,372 (36.3)	788 (34.4)	0.08
Body mass index (kg/m ²)	26.5 ± 4.3	26.0 ± 4.9	0.0001

*Data are given as mean ± standard deviation or No (%).

plete responses to other questions. All analyses were performed on 9,297 subjects.

Subjects in rural areas

Of 3,001 parents and grandparents of primary school students 2,784 returned the questionnaires, giving an overall response rate of 92.7%. A total of 491 subjects were further excluded from the study because of their responses of “do not know” and/or “not sure” to the questions related to quality of life, and due to incomplete responses to other questions. All analyses were performed on 2,293 subjects.

Table 1 shows the characteristics of the subjects from urban and rural Kirikkale. Smoking was not different among subjects from urban and those from rural areas. SF-12 physical component summary (PCS), mental component summary (MCS), and overall scores were lower in subjects from rural than those from urban areas.

Mean HADS overall score was higher in subjects from rural than those from urban areas (Table 2). High HAD total score was more common among subjects from rural than those from urban areas (n: 3945/9115 (43.3%) vs n: 960/1846 (52.0%), $P=0.0001$). Both anxiety and depression were different among subjects from urban and those from rural areas (Table 4). The percentage of both anxiety and depression was found to be statistically higher in rural subjects than urban.

A linear regression model showed associations between SF-12 overall, PCS, and MCS scores with HAD total score after adjusting for gender, age, BMI, smoking, income, and education (Table 3).

Discussion

The present study revealed that health-related quality of life scores were lower in subjects from rural than from urban areas. We found that both anxiety and depression was more common in rural. This might be

TABLE 2. SF-12 quality of life scores for subjects from urban and rural.

	Urban n = 9,297	Rural n = 2,293	P
SF-12 PCS score	49.3±12.8	45.9±13.4	0.0001
SF-12 MCS score	46.8±13.0	45.0±13.8	0.0001
SF-12 overall score	48.0±11.5	45.4±12.3	0.0001
HADS overall score	14.8±6.8	16.6±6.8	0.0001

Data are given as mean ± SD. SF-12: short form health survey-12, PCS: physical component summary, MCS: mental component summary, HADS: hospital anxiety and depression scale.

* $P < 0.001$ for comparison with control group.

TABLE 3. Predictors of SF-12 overall, PCS and MCS scores after adjusting for sex, age, body mass index, smoking, income and education*

Variables	SF-12 overall score		SF-12 PCS score		SF-12 MCS score	
	β	P ($r^2 = 0.41$)	β	P ($r^2 = 0.35$)	β	P ($r^2 = 0.33$)
Sex	0.13	0.0001	0.15	0.0001	0.11	0.0001
Age	-0.14	0.0001	-0.20	0.0001	-0.06	0.0001
Body mass index	-0.03	0.0001	-4	0.0001	-0.01	0.04
Income	-0.04	0.0001	-0.05	0.0001	-0.03	0.0001
Education	0.07	0.0001	0.11	0.0001	0.03	0.0001
Smoking	-0.03	0.0001	-0.02	0.001	-0.03	0.0001
HADS overall score	-0.51	0.0001	-0.41	0.0001	-0.51	0.0001

*SF-12 = Short-Form 12 Health Survey; PCS = physical component summary; MCS = mental component summary.

β is the standardized regression coefficient.

explained in two ways: both socio-economic status and quality of life are poorer in rural Turkish population. In the linear regression model, the important association between quality of life and psychological distress provided additional evidence for the proposed relationship. Accordingly, psychological distress in subjects from rural areas may cause deterioration in quality of life. It is not known how urban or rural living influences quality of life. Studies, from population samples, indicated that, compared with their urban and suburban counterparts, veterans who lived in a rural setting had worse health-related quality-of-life scores.^{12,13} In another study, an urban elderly population had greater health-related quality of life on most scales, particularly on the physical health scales.¹⁴ Study by Mainous and Kohrs also indicated that, although the health status of rural and urban adults was generally similar, the rural elderly had worse health status than their urban counterparts.¹⁵ There are different results in studies regarding the impact on psychological condition of rural and urban areas. In a study by Kovess-Masfety et al, urbanicity seemed to be linked to a higher risk of mental health disorders, particularly depressive disorders, whereas the link to anxiety disorders was only moderate.¹⁶ In another study, symptoms of anxiety and depression occurred with similar frequency in both urban and rural areas.¹⁷ To explain the difference, further analysis and investigation of social and environmental factors are needed. The present results indicate that quality of life scores

vary between areas. Psychological distress of subjects in rural areas may be the cause of the poorer scores of quality of life. These findings need support by further prospective longitudinal studies.

Potential limitations of our study, as in other epidemiological studies, were that the presence of symptoms was determined from self-reporting by subjects. People are more likely to report symptoms if they have an abnormal psychological condition, such as anxiety or depression.¹⁸ There may be a tendency for anxiety or recent stressful life events to influence how a person responds to a question. Symptoms may reflect an increased awareness of physical symptoms in individuals with psychological problems.¹⁹ Therefore, HRQL is a subjective health measure that can be influenced by a subject's perceptions, expectations and interpretations about health.²⁰ Increased awareness of symptoms by psychological distress may lead to reduced HRQL. These may account for impairment of HRQL in the presence of psychological distress.

Consequently, we enrolled only parents and grandparents with school-aged children in this study. Although we do not think people of the same age and sex who do not have school aged children differ from those included in the study, the results of our study may not be standardized to whole Kirikkale city population. Results from this study may also not be translated to populations with different demographic characteristics in Turkey or other parts of the world.

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