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"The Göteborg Quality of Life Instrument" – An Assessment of Well-being and Symptoms Among Men born 1913 and 1923

Methods and Validity

GÖSTA TIBBLIN, BODIL TIBBLIN, SUZANNE PECIVA, SVEN KULLMAN and KURT SVÄRDSUDD

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ABSTRACT. "The Göteborg quality of life instrument" (GQL-instrument) has been used to assess the quality of life of men born in 1913 and 1923. On a population basis, it was possible to show that the well-being variables were stable over time and that excellent well-being showed a great variation. A high level of well-being was common in variables such as family and housing but more uncommon in variables such as fitness, vision, hearing and memory. Symptoms were often significantly related to biomedical variables such as body mass index, blood pressure, lung function, blood lipids, fasting blood sugar and fasting insulin. The GQL-instrument seems to provide a reliable and stable assessment of well-being and symptoms and is useful both as a descriptive tool, and as a help in evaluating treatment, and it also has predictive power.

Key words: Quality of life instrument, population study of men, methods and validity.

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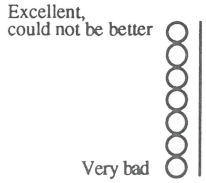
A group working with epidemiological methods was set up in Göteborg in 1963. The aim of the studies was to examine the development of chronic disease in middle-aged men. The studies started in 1963 with an examination of 50-year-old men born in 1913 with the purpose of elucidating such factors as cardiovascular morbidity, symptomatology and risk factors [1].

In 1973 the concept of quality of life was more or less unknown, but we felt a need of assessing the social, physiological and psychological well-being in these men using the WHO definition of health. A scale was constructed with seven steps (score 1–7) with the extreme points defined as "excellent, could not be better" and "very bad". A questionnaire covering the 30 most common symptoms was also used. The forms are presented in figs 1 and 2.

When Walter O Spitzer, in a keynote addressed to the Portugal conference, defined quality of life as a concept which included physical function, social function and mental status plus burden of symptoms and perception or sense of well-being, we realized that our instrument can be used as an assessment of quality of life [2]. According to Spitzer, scores can not only be taken from the objective assessment of a clinician after observing or examining a patient as to



Social well-being	Physical well-being	Mental well-being
Work	Health	Mood
Family	Fitness	Energy
Economy	Hearing	Endurance
Housing	Vision	Self esteem
	Memory	Sleeping
	Appetite	

Fig. 1. A summary of well-being scales in the "GQL-instrument".

Questionnaire about symptoms

Have you been troubled by any of the following symptoms during the last three months?

		Yes	No
1.	Dizziness	☐	☐
2.	Eye-problem	☐	☐
3.	Impaired hearing	☐	☐
4.	Headache	☐	☐
5.	General fatigue	☐	☐
6.	Sleeping disturbance	☐	☐
7.	Nervousness	☐	☐
8.	Sweating	☐	☐
9.	Breathlessness	☐	☐
10.	Chest pain	☐	☐
11.	Coughing	☐	☐
12.	Irritability	☐	☐
13.	Exhaustion	☐	☐
14.	Impaired concentration	☐	☐
15.	Restlessness	☐	☐
16.	Depression	☐	☐
17.	Cries easily	☐	☐
18.	Difficulty to relax	☐	☐
19.	Abdominal pain	☐	☐
20.	Nausea	☐	☐
21.	Diarrhoea	☐	☐
22.	Constipation	☐	☐
23.	Anorexia	☐	☐
24.	Loss of weight	☐	☐
25.	Overweight	☐	☐
26.	Feeling cold	☐	☐
27.	Difficulty in passing urine	☐	☐
28.	Pain in the joints	☐	☐
29.	Back ache	☐	☐
30.	Pain in the legs	☐	☐

Fig. 2. The symptom-questionnaire in the "GQL-instrument".

how he or she feels at a given point in time, but also from reports by respondents of subjective perception. Our quality of life instrument is limited to the perception of the subjects.

METHODS AND MATERIAL

The men born in 1913 and 1923 have been described elsewhere [1, 3]. The present paper deals with results taken from the examinations in 1973 and 1980. In 1973 945 men aged 60 were invited to participate and 787 were examined. The same year were also men born in 1923 invited to participate, and of these 226 were examined.

In order to study the validity of our GQL-instrument [Figs 1 and 2], we analysed the following variables: systolic and diastolic blood pressure, body mass index, cholesterol, triglycerides, peak flow, fasting insulin and fasting blood sugar. The methods used are described in detail elsewhere [3].

In 1980 644 men born 1913 and aged 67 were examined.

STATISTICAL METHODS

Standard metods were used to obtain summary statistics. Possible relationships were tested with "Pitman's non-parametric permutation test" in its univariate and multivariate form. For this report the

Table I. Excellent well-being (score 1.2). Family.

	60 years 1973 (n = 742)	67 years 1980 (n = 644)
Unmarried	62%	61%
Married	87%	82%
Divorced	62%	57%
Widowed	39%	32%

Table II. Excellent well-being (sc

	60 years 1973 (n = 742)
Social well-being	
Work	58%
Famliy	81%
Economy	61%
Housing	77%
Physical well-being	
Health	55%
Fitness	30%
Hearing	57%
Vision	31%
Memory	39%
Appetite	82%
Mental well-being	
Mood	67%
Energy	52%
Endurance	55%
Self-esteem	64%
Sleeping	63%

test was used as a trend test, i.e. d
groups were considered only if th
All tests were two-tailed. A *p*-val
was regarded as statistically signi

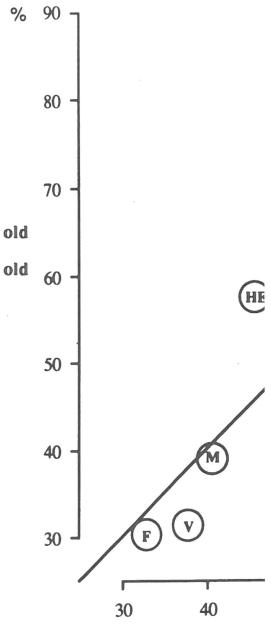


Fig. 3. A comparison between differ

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39%	32%

Table II. Excellent well-being (score 1–2).

	60 years 1973 (n = 742)	67 years 1980 (n = 644)
Social well-being		
Work	58%	–
Famliy	81%	77%
Economy	61%	63%
Housing	77%	80%
Physical well-being		
Health	55%	58%
Fitness	30%	33%
Hearing	57%	45%
Vision	31%	38%
Memory	39%	40%
Appetite	82%	80%
Mental well-being		
Mood	67%	72%
Energy	52%	52%
Endurance	55%	59%
Self-esteem	64%	66%
Sleeping	63%	65%

test was used as a trend test, i.e. differences between groups were considered only if they formed a trend. All tests were two-tailed. A p-value of less than 0.05 was regarded as statistically significant.

RESULTS

Symptoms in relation to well-being

A crucial question in quality of life research has been whether objective measures of the quality of life are more valid than subjective ones. In order to elucidate this question, we need to understand the association between objective and subjective measures of health.

In the present study we compared participants who reported themselves as unmarried, married, divorced and widowed with their scoring of family satisfaction (score 1–7; 1 being "excellent, could not be better" and 7 being "very bad"). In Table I it is clear that married participants ranked their family situation much higher than the widowed. The pattern of scoring was the same when at 60 and 67. The results show that family well-being is rather stable over time and that civil status does not affect the way of rating over time.

The whole set of well-being scales was compared in 1973 and in 1980 in mainly the same participants born in 1913, but in 1973 the men born 1923 and a few who had moved into Göteborg were also included. Despite the 7-year lapse in time the percentage of excellent scores (1–2) was roughly the same.

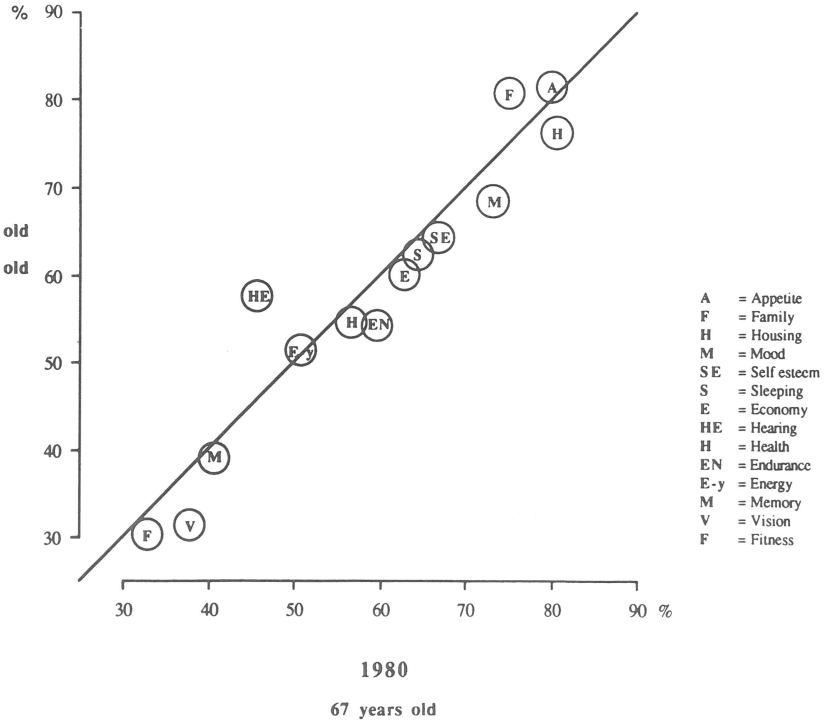

Fig. 3. A comparison between different well-being scales 1973 and 1980 – percentage with score 1–2.

Table III. Significant correlations ($p < 0,05$) between symptoms and physiological and biochemical variables in men born 1913 and 1923 (n = 1013).

+ SBP	− SBP	+ DBP	− DBP
Overweight Cries easily Sleeping disturbances	Loss of weight Feeling cold	Overweight Cries easily Sleeping disturbances	Loss of weight
+ Chol	**− Chol**	**+ TG**	**− Peakflow**
Chest pain	Abdominal pain	Depression General fatigue Irritable Difficult to relax Overweight Sweating Chest pain Breathlessness Headache	Chest pain Breathlessness Cough Dizziness Anorexia Bach ache Pain in the legs Feeling cold Loss of weight Cries easily Depression General fatigue Sleeping disturbances Nervousness
+ BMI	**− BMI**	**+ Fast insulin**	**− Fast insulin**
Overweight Sweating Breathlessness Impaired hearing	Anorexia Nausea Abdominal pain Feeling cold Loss of weight	Overweight Sweating Dizziness Coughing	Feeling cold
+ Fast bloodsugar	**− Fast bloodsugar**		
Sweating Breathlessness	Depression Nervousness Restlessness Anorexia Abdominal pain Loss of weight		

The difference between the two occasions is seldom more than 2–3 per cent [Table II]. The exception is "hearing excellent", which dropped from 57% to 45%. From Fig. 3 it is clear that the grading of excellent well-being is stable over time. Appetite, family and housing top the list and fitness, vision and memory come last.

As far as hearing was concerned, it was possible to compare the scoring of hearing with the results of an assessment with a pure tone audiometer. There is a striking correlation between the hearing scale and the objective method [Table IV].

Symptoms in relation to biochemical and physiological variables

A way of studying concurrent validity is to look at the association between our 30 symptoms and some biomedical variables measured at the same time. The variables studied are body mass index, systolic and diastolic blood pressure, cholesterol, triglycerides, peak flow and in a subsample, fasting insulin (n = 219) and fasting blood sugar (n = 352).

Table III shows the symptoms that are positively (+) and negatively (−) related to the biomedical

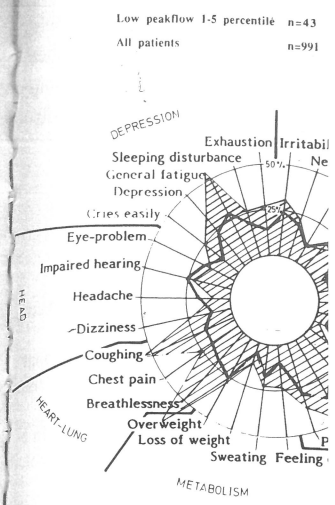

Fig. 4. The symptoms of participar

variables. As expected, many s to these variables. A few sym problems, exhaustion, difficulty pain in the joints, are not at biomedical variables.

Interestingly enough, several tively related to low blood pre low fasting blood sugar. Low lur to 14 symptoms – not only heart but also several mental sympto and pain in the legs.

The symptom profile for low centile) is presented as an illustı toms can be described graphic toms were equal or less in the group compared with all patient not indicate general over-reporti symptoms of low lung function depression, cries easily, coughi ness.

Table IV. Mean value of tone au

No.	Hearing
1	(n = 256)
2	(n = 170)
3	(n = 113)
4	(n = 99)
5	(n = 66)
6	(n = 29)
7	(n = 14)

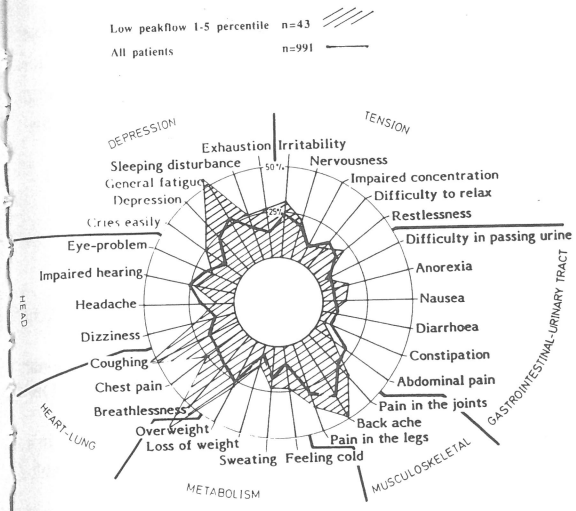

Fig. 4. The symptoms of participants with low peak flow.

variables. As expected, many symptoms are related to these variables. A few symptoms such as eye-problems, exhaustion, difficulty in passing urine and pain in the joints, are not at all related to these biomedical variables.

Interestingly enough, several symptoms are negatively related to low blood pressure, low BMI and low fasting blood sugar. Low lung function is related to 14 symptoms – not only heart and lung symptoms but also several mental symptoms and back-aches and pain in the legs.

The symptom profile for low peak flow (1–5 percentile) is presented as an illustration of how symptoms can be described graphically. Several symptoms were equal or less in the low lung function group compared with all patients. These findings do not indicate general over-reporting [Fig. 4]. Typical symptoms of low lung function are general fatigue, depression, cries easily, coughing, and breathlessness.

Table IV. Mean value of tone audiometry.

No.	Hearing	dB
1	(n = 256)	24.4
2	(n = 170)	31.3
3	(n = 113)	32.9
4	(n = 99)	38.9
5	(n = 66)	45.2
6	(n = 29)	48.8
7	(n = 14)	71.9

DISCUSSION

There is a considerable interest in broadening the focus of health-status assessment beyond mortality and those biomedical variables that have traditionally been measured. Many differing opinions are expressed in the literature on quality of life assessment, one of the main issues being what is the most objective way of reporting such subjective assessments.

In this article we present an assessment of well-being and symptoms that is based on the perception of the participants. It was constructed before the quality of life interest had been aroused in medicine and can therefore be regarded as an ad hoc instrument. From the WHO definition of health, including physical, mental and social well-being, fifteen variables were selected covering work, family, economy, housing, global health, fitness, hearing, vision, memory, appetite, mood, endurance, self-esteem and sleeping. The scale consisted of seven levels with the extreme levels defined as "excellent, could not be better" (1) and "very bad" (7).

The symptoms assessment was based on a questionnaire with 30 symptoms. The participant answered "yes" if the symptom had bothered him during the previous three months.

In the paper all variables are presented separately; a summary health index is not used. The questionnaire was self-administered but staff were available to answer questions about the procedure. The time spent with the instrument varied all together between 5–15 minutes. Missing data were few, less than 1 per cent.

One problem of all quality of life instrument tests is the lack of validity. A crude way of examining how well scales really assess what is intended is to study age variations of well-being dimensions. This was done in an earlier study of men aged 30, 50 and 60 [5]. The results confirmed reports in the literature. Excellent social well-being (groups 1–2) is unchanged by age except for work, where there is a significant downward trend. Concerning physical well-being, fitness and appetite are unchanged but global health, hearing, vision and memory show a significant decrease. Mental well-being is significantly reduced for energy, self-esteem and sleeping, but unchanged for other variables.

Validation leads to a better understanding of the scores. In the present study, it is possible to show that the scoring of excellent well-being is stable for

all studied variables on a population basis. The variation of excellent well-being between different domains was between 30 to 80 per cent. It is also possible to show that the variable hearing shows an excellent correlation with pure tone audiometry.

An analyse of the strength of bivariate associations in comparison with other measures of health, e.g. biomedical variables, the symptoms show many correlations, both negative and positive. This type of comparison may help us to find new homogeneous sub-groups of subjects to study, ones that do not necessarily fit in with the traditional concepts of disease. The syndrome of low lung function is one interesting example.

A quality of life instrument can be used as a descriptive tool for population studies. One important purpose is to evaluate new therapies, which often requires an understanding of the total impact of the interventions, that is, of the effects on the biomedical, social and behavioural status of the patient. Quality of life can also be regarded as a variable involved in the aetiology of the disease. Another article in this supplement points out the relationship between many well-being variables and serious disease/death.

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