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The Flanagan Quality of Life Scale: Evidence of Construct Validity

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Abstract

Background: The Quality of Life Scale (QOLS), developed originally by John Flanagan in the 1970's, has been adapted for use in chronic illness groups. Evidence for reliability and validity has been published over the years for both English and translations. This paper presents further evidence of construct validity for persons with chronic conditions as well as across two languages, and gender.

Methods: A sample of 1241 chronically ill and healthy adults from American and Swedish databases was used to generate factor analyses for both the 15-item original QOLS and the 16-item chronic illness adaptation.

Results: Analysis of the data suggested that the QOLS has three factors in the healthy sample and across chronic conditions, two languages and gender. Factors that could be labeled (1) Relationships and Material Well-Being, (2) Health and Functioning, and (3) Personal, Social and Community Commitment were identified.

Conclusions: The QOLS is a valid instrument for measuring domains of quality of life across diverse patient groups.

Background

Quality of life (QOL) measures have become a vital and often required part of health outcome appraisal. For populations with chronic disease, measurement of QOL provides a meaningful way to determine the impact of health care when cure is not possible. Hundreds of instruments have been developed to measure QOL [1]. Many of these instruments measure only health-related aspects of QOL such as functional status, symptoms, disease processes, or treatment side effects. As such they are useful as treatment outcome measures but may not cover the wide-range of domains that are important to an individual's life. The

Flanagan Quality of Life Scale (QOLS) takes this issue into account [2,3].

The QOLS was developed in the United States during the 1970's to measure the quality of life across a random sampling of 3000 American adults using an interview technique. In a second step, Flanagan used the instrument to survey a total of 3,000 people, ages 30, 50, and 70. The results of this national survey revealed that most people of both genders and all three ages felt that the items were important to them. The original QOLS contained 15 items representing 5 conceptual domains of QOL: physical and

Table 1: Flanagan Quality of Life Scale

Conceptual Category	Scale Item
Physical and Material Well-being	Material well-being and financial security
Relations with other People	Health and personal safety Relations with parents, siblings, other relatives Having and raising children Relations with spouse or significant other Relations with Friends
Social, Community, and Civic Activities	Activities related to helping or encouraging others Activities related to local and national government
Personal Development and Fulfillment	Intellectual development Personal understanding Occupational role Creativity and personal expression
Recreation	Socializing Passive and observational recreational activities Active and participatory recreational activities

material well being, relationships with other people, social and civic activities, personal development, and recreation (Table 1).

However, Flanagan believed that some adaptations for persons with chronic conditions or disabilities might be needed and that different rating scales might produce divergent results [3]. In 1981 he gave the first author permission to adapt the scale if necessary for patients with chronic illness. A study of content validity of the QOLS, in which Americans with chronic illness were asked open-ended questions about what the term "quality of life" meant to them and what was important to their QOL, generated words and phrases that were very similar to those used by the general population that Flanagan had studied [4]. However, they also generated a list of phrases that could be best described as "efforts to remain independent" using words and phrases, such as "independence" and "able to care for myself." This concept was added to the QOLS as a 16th item – Independence, ability to do for oneself as the only adaptation of item content.

Over the ensuing 20 years, several researchers have used the 16-item English language adapted version of the QOLS as well as translations of the QOLS to gather quantitative QOL information from people with chronic illnesses and healthy samples. These illnesses include diabetes mellitus, osteoarthritis, and post-ostomy surgery patients [4], rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE) [4–6], chronic obstructive pulmonary disease (COPD) [7], fibromyalgia syndrome (FMS) [8,9], psoriasis [10], heart disease [11], spinal cord injury [12], and low back pain [13].

Flanagan did not report psychometric data in his instrument development work. Estimates from the first study of

240 American patients with chronic illness indicated that the 15-item QOLS satisfaction scale as one scale containing all 15 items was internally consistent ($\alpha = .82$ to $.92$) and had high test-retest reliability over 3 weeks in stable chronic illness groups ($r = 0.78$ to $r = 0.84$) [4]. Researchers have reported similar reliability estimates in translations of the QOLS that have been made in Swedish [6], Hebrew [9], Norwegian [10] and Mandarin Chinese [12]. Content validity work on the Swedish version of the QOLS has also suggested that the items are valid in the Swedish population [14].

Convergent and discriminant construct validity of the QOLS in chronic illness groups was evidenced first by the high correlations between the QOLS total score and the Life Satisfaction Index-Z (LSI-Z) [15] ($r = 0.67$ to 0.75) and its low to moderate correlations with the physical health status subscale ($r = 0.25$ to 0.48) from the Duke-UNC Health Profile [16] and a disease impact measure, the Arthritis Impact Measurement Scales (AIMS) [17] ($r = 0.28$ to 0.44) [4]. Later evidence that the QOLS could discriminate levels of QOL in populations that would be expected to differ emerged. A group of healthy adults as well as groups with more stable chronic illnesses, such as post-ostomy surgery, osteoarthritis, and rheumatoid arthritis, were shown to have significantly higher scores than groups of patients with the persistent painful condition, fibromyalgia, life-threatening COPD, or insulin-dependent diabetes [18].

Although Flanagan conceptually defined 5 major categories within which the 15 items of his scale could be placed, no factor analysis work was ever published to confirm those categories. Therefore, our aim was to determine whether a stable factor structure existed within the scale. This would provide additional evidence for construct

Table 2: Demographic Characteristics of the Samples

Variable	Total Sample (n = 1241)	Healthy Sample (n = 319)	American Chronic Illness Sample (n = 584)	Swedish Chronic Illness Sample (n = 170)	American COPD Sample (n = 168)
Age (mean & SD)	52.5 (14.1)	44.5 (9.2)	55.6 (14.4)	44.8 (10.6)	67.4 (7.8)
% Female	72	59	74	100	49
% Married or Cohabiting	66	81	62	57	64
% completed high school or higher	76	----	85	42	72
Occupation – skilled or higher	82	----	82	82	----
Employed at least part-time	65	91	36	57	----
Retired	22	9	46	15	----
Disabled	11	0	14	25	----

validity. The purpose of this paper is to report the results of analyses that focused on determining whether the conceptual categories proposed by Flanagan are present in empirical data or whether a different conceptual model of the instrument is more appropriate. The validity of the model across chronic conditions, translations, and gender was also tested as a way of determining the generalizability of the instrument.

Methods

Design

The study used secondary analysis of a database developed from American and Swedish persons with chronic illnesses and a healthy comparison group from both countries. All projects from which the database were derived had been approved by the appropriate institutional review board or ethical committee for the protection of human subjects.

Subjects

The subjects for these analyses were drawn from the database maintained by the first author. It contained 922 adults with chronic illnesses and 319 healthy comparison subjects.

Sample 1

319 healthy men and women, 269 drawn from a random sample of Swedish adults and 50 volunteers drawn from an educational facility in the United States.

Sample 2

584 adult men and women outpatients from the specialty clinics of a large health sciences university in the United States. Diagnoses of the patients were: rheumatoid arthritis (n = 181), osteoarthritis (n = 98), lupus and other rheumatic diseases (n = 48), diabetes mellitus (n = 60), chronic obstructive pulmonary disease (n = 60), post-ostomy surgery (n = 61), fibromyalgia (n = 76).

Sample 3

170 adult women outpatients from the rheumatology clinic of a university hospital in Sweden. Diagnoses of these patients were: rheumatoid arthritis (n = 50), lupus (n = 50), fibromyalgia (n = 20).

Sample 4

168 adult men and women outpatients with COPD drawn from two private pulmonary specialty practices in the United States.

The demographic characteristics of these samples are shown in Table 2.

Instrument

The Flanagan QOLS [2] used a five-point likert-type scale that measured "satisfaction with needs met." No reliability of this scaling was reported at the time. Earlier work by Andrews and Crandall [19] had suggested that a 7-point scale anchored with the words "delighted" and "terrible" was more sensitive and less negatively skewed than a 5-point satisfaction scale for quality of life assessment. The seven responses were "delighted" (7), "pleased" (6), "mostly satisfied" (5), "mixed" (4), "mostly dissatisfied" (3), "unhappy" (2), "terrible" (1). For the English language work reported here, the 7-point delighted-terrible scale was used to measure satisfaction. A 7-point satisfaction scale anchored with "very satisfied" and "very dissatisfied" was used in the Swedish samples because the delighted-terrible scaling could not be made meaningful in Swedish [6]. The amount of skewness in the items did not differ despite the differences in wording (Unpublished data). In this study, both the 15-item QOLS and the 16-item QOLS with the independence item added were analyzed.

Data Analysis

Exploratory principal components analysis with orthogonal rotation was used to develop the factor model. Conceptual categories originally described by Flanagan were considered to be independent of each other. Examination

Table 3: Exploratory factor analysis of the Quality of Life Scale (QOLS) with 319 healthy subjects.

Item	Factor 1	Factor 2	Factor 3
1. Material well-being	.151	.737	.077
2. Health	.109	.751	.115
3. Relationship with relatives	.550	.343	.025
4. Having and raising children	.617	.031	.022
5. Relationship with spouse or significant other	.655	.316	.072
6. Having close friends	.794	.236	.112
7. Helping others	.492	.011	.554
8. Civic activities	.015	.043	.752
9. Intellectual development	.068	.186	.738
10. Understanding of self	.309	.337	.427
11. Occupational role	.225	.721	.181
12. Creativity/personal expression	.011	.180	.757
13. Socializing	.675	.293	.249
14. Passive recreation	.400	.312	.289
15. Active recreation	.282	.634	.217

of scree plots of eigenvalues was used to determine the number of factors to be retained in each analysis. The default eigenvalue of 1.0 was used. Variables within factors with loadings of .40 or above were considered to be significantly related to the factor and retained [20].

In all five exploratory analyses were carried out. Because the QOLS had been developed originally from the work on a healthy population, the first exploratory analysis on the 15-item QOLS was carried out with the healthy American and Swedish sample. Then, the sample of 584 Americans with chronic illness was subjected to the exploratory analysis. After those samples were analyzed, the sample of 170 Swedes with chronic illness was analyzed to determine the factor structure in the Swedish version of the QOLS. Finally, two further analyses in which the samples above were combined with another 168 subjects with COPD were run by gender using the 16 item QOLS.

Results

As seen in Table 3, the first analysis on the healthy sample yielded a 3-factor solution composed of a first factor that contained all 4 relationship items (#3,4,5,6) from Flanagan's conceptual category of relationships with other people and the socializing (#13) and passive recreation (#14) items from the recreation category. The second factor combined Flanagan's conceptual category of physical and material well being (#1,2) with occupational role (#11) from the personal development and fulfillment category and active recreation (#15) from the recreation category. The third factor combined the social, community, and civic activities conceptual category items (#7,8) with 3 of the personal development and fulfillment items (#9,10,12). Activities related to helping others (#7) was

considered complex as it loaded significantly on more than one factor.

In the second factor analysis in which the Americans with chronic illness were studied (Table 4), the first factor was composed of all the items in the social, community and civic activities category (#7,8), 3 of the 4 items in personal development and fulfillment (#9,10,12) as well as 2 items from recreation (#13,14). The second factor was composed of 3 items of health (#2), occupational role (#11) and active recreation (#15). The third factor contained 5 items, material well being (#1) and all four relationship items (#3,4,5,6).

The third factor analysis, run on the Swedish version of the QOLS, also yielded a 3-factor solution resembling the American chronic illness sample results in its factor structure (Table 4). All items in the Swedish sample loaded on the same factors as the American sample, with the exception of *relationship with relatives*, which loaded on Factor 3 in the American sample, and on Factor 1 in the Swedish sample. Three items in these two sample loaded on more than one factor. These were item #13 – socializing, in the American sample and #3, relationship with relatives, and #6, having close friends, in the Swedish sample.

Finally, two exploratory factor analyses were run by gender. In all there were 888 women and 353 men. These analyses also yielded three-factor solutions (Table 5). Results for the sample of women were identical to the American chronic illness sample factor analysis, with item 16, independence, loading on the factor containing health, work and active recreation. For men, all items that loaded on a factor were the same as in the American sam-

Table 4: Exploratory factor analysis of the Quality of Life Scale (QOLS) using 584 Americans with chronic illness (Study 1) and 170 Swedish women with chronic rheumatic disease (Study 2).

Item	Study 1			Study 2		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
1. Material well-being	.126	.349	.500	.004	.007	.709
2. Health	.158	.775	.121	.003	.646	.151
3. Relationship with relatives	.005	.134	.771	.518	.142	.487
4. Having and raising children	.145	.006	.662	.007	.323	.598
5. Relationship with spouse or significant other	.201	.009	.649	.001	.170	.647
6. Having close friends	.352	.156	.527	.429	.001	.643
7. Helping others	.720	.003	.204	.695	.245	.009
8. Civic activities	.585	.268	.005	.783	.009	.144
9. Intellectual development	.585	.223	.148	.716	.201	.123
10. Understanding of self	.598	.146	.257	.481	.265	.266
11. Occupational role	.270	.666	.190	.250	.684	.110
12. Creativity/personal expression	.541	.392	.151	.660	.332	.002
13. Socializing	.536	.444	.199	.598	.388	.274
14. Passive recreation	.579	.009	.009	.620	.004	.119
15. Active recreation	.204	.811	.006	.182	.825	.002

Table 5: Exploratory factor analyses of the Quality of Life Scale (QOLS) using 913 subjects.

Item	Men (n = 353)			Women (n = 888)		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
1. Material well-being	.331	.274	.264	.088	.201	.600
2. Health	.790	.105	.078	.128	.747	.193
3. Relationship with relatives	.154	.138	.673	.210	.050	.643
4. Having and raising children	.030	.232	.591	.062	.116	.579
5. Relationship with spouse or significant other	.038	.026	.750	.062	.116	.695
6. Having close friends	.200	.068	.755	.310	.078	.657
7. Helping others	.126	.611	.254	.646	.125	.224
8. Civic activities	.121	.627	.034	.741	.003	.009
9. Intellectual development	.094	.729	.103	.697	.133	.118
10. Understanding of self	.189	.628	.163	.497	.280	.299
11. Occupational role	.685	.150	.228	.336	.658	.200
12. Creativity/personal expression	.150	.732	.052	.676	.268	.067
13. Socializing	.477	.231	.451	.555	.373	.334
14. Passive recreation	.265	.294	.272	.533	.134	.216
15. Active recreation	.805	.187	.142	.258	.758	.109
16. Independence	.687	.126	.013	.049	.724	.068

ple also. However, one item, socializing (#13) loaded on two factors while material well-being (#1) and passive recreation (#14) did not load significantly on any factor.

Discussion

From earlier work, it is evident that the QOLS is a reliable instrument for measuring quality of life from the perspective of the patient. Evidence of convergent and discriminant construct validity has also been provided previously [4]. The factor analyses described here provide additional indications for construct validity of the scale. The QOLS has a fairly stable factor structure across samples that are diverse in health, culture, and gender. Twelve of the 16

items loaded consistently with the same items on three factors in all five exploratory analyses.

Differences between the healthy sample and the two chronic illness samples were minimal. Material well-being (#1) loaded with the health, work and active recreation items in the healthy sample and with the relationship items in the chronic illness samples. Other than that difference, there were no other clear differences in the factor structures of the three samples. Four items (#3, relationship with relatives; # 6, having close friends; #7, helping others; and #13, socializing) loaded significantly on two different factors in one or the other of the three samples.

All of these items can easily be seen as relating to either personal relationships or to the broader relationships one has with a larger social group. As such, they are complex variables that should be more clearly worded in any revision of the QOLS in order to place them more accurately within one or the other factor.

Flanagan's developmental work led him to conceptualize the 15 items of importance to people's quality of life in five categories (Table 1). The three factor structure that emerged from these more recent analyses is overall consistent with Flanagan's conceptualization in that two of the factors are essentially combinations of Flanagan's categories

All of Flanagan's relationship items loaded on a single factor, along with *material well-being and financial security*. This factor was named *Relationships and Material Well-being*. Others have established the preeminence of personal relationships in peoples' judgments of their quality of life [21]. Thus, it is not surprising that the relationship items loaded together. The loading of material well-being on this factor was unexpected, since material well-being does not seem, at first glance, to be conceptually related to relationships. In early social science research [22], the objective conditions of life (financial security and the material goods money can buy) were not related to quality of life perceptions, so loading of this item with relationships (which are known to be very important to quality of life) was not initially expected. Perhaps both material well-being and close personal relationships are related to a sense of security that people interpret as central to quality of life.

The second factor, here named *Personal, Social, and Community Commitment* includes items related to personal expression, as well as meaningful involvement in the lives of others and society at large. This factor essentially collapsed two of Flanagan's conceptual categories into one. Development of the intellect and understanding the self are extended to nurturing the development of others and participation in civic life, all of which provide different kinds of satisfaction the close personal relationships found in the *Relationship and Material Well-being* factor.

The unique faactor that emerged from the analyses was composed of three items related to health and functional activity (health, occupational role, and active recreation,) here named *Health and Functioning*. This factor drew on items from three of Flanagan's conceptual categories and in the 16-item QOLS analysis, the independence item loaded on this factor as well. It is likely that in today's society with its concomitant trends of longevity and public acknowledgment of the benefits of physical activity, people link the idea of health with unrestricted physical

functioning and role performance. It is important to note also that the independence item that was added to the original Flanagan instrument is strongly and consistently related to the other three items in this factor. Therefore, it is clearly relevant to the quality of life of chronically ill people.

Two items, material well-being and passive recreation, did not load on any factor in the male sample. Low correlations or factor loadings of variables with identified factors may mean that the items are unreliable or outliers in the particular sample that was factor analyzed. No statistical explanation for the low factor loadings was found as the variables were not abnormally skewed or lacking in variance. It may be that for the men in this sample, material well-being and passive recreation were not relevant to their concept of life quality and thus, did not correlate with the other items.

Strengths of this study include the large data sets available for testing, the diversity of the samples with regard to age, health status, work status, culture, and gender. Because the three-factor solution was consistent across three samples, it may be useful to make subscale scores of the instrument. One might expect that the Health and Functioning factor would change as a result of various treatment strategies. It also seems likely that the Relationships and Material Well-being factor could change in a positive direction as a result of strategies specifically designed to assist persons with chronic illness to return to work and active roles. We suggest that the socializing item (#13) which was conceptually complex be placed in the Personal, Social and Community Commitment factor and that the relationship with relatives (#3) and having close friends (#6) remain in the Relationship and Material Well-Being factor.

Limitations of this work are that the majority of subjects were white females who, based on education level, were from the middle class. Additional samples including larger proportions of men, non-whites, and people of different socioeconomic classes are needed to provide additional evidence for instrument validity in these populations.

Conclusions

The QOLS is a reliable and valid instrument for measuring domains of quality of life important to patients across groups and cultures.

Author Contributions

CSB conceptualized the original testing of the QOLS, collected and analyzed data, wrote the original draft of the manuscript and lead the group in revising the manuscript.

KLA collected and analyzed COPD data, and reviewed and revised the manuscript.

BA collected and analyzed data from the Swedish rheumatology sample and reviewed the manuscript.

OH collected and analyzed data from the Swedish healthy group and reviewed the manuscript.

All authors reviewed the final draft of the manuscript and approved its contents.

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