The QOL-DASS Model to Estimate Overall Quality of Life and General Subjective Health

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Objective: In order to find how rating the WHOQOL-BREF and DASS scales are combined to produce an overall measure of quality of life and satisfaction with health rating, a QOL-DASS model was designed ; and the strength of this hypothesized model was examined using the structural equation modeling**.**

Method: Participants included a sample of 103 voluntary males who were divided into two groups of unhealthy (N=55) and healthy (N=48). To assess satisfaction and negative emotions of depression, anxiety and stress among the participants, they were asked to fill out the WHOQOL-BREF and The Depression Anxiety Stress Scale (DASS-42).

Results: Our findings on running the hypothesized model of QOL-DASS indicated that the proposed model of QOL-DASS fitted the data well for the both healthy and unhealthy groups**.**

Conclusion: Our findings with CFA to evaluate the hypothesized model of QOL-DASS indicated that the different satisfaction domain ratings and the negative emotions of depression, anxiety and stress as the observed variables can represent the underlying constructs of general health and quality of life on both healthy and unhealthy groups.

Keywords: *Anxiety, Depression, Quality of Life, Statistical models, Stress*

Various definitions of quality of life have been proposed by different researchers. However, it seems that no general agreement exists on the accepted definition of QOL in the extensive literature which has been generated on this subject over the past thirty years (1). Farquhar (2) states that q uality of life 'is a problematic concept as different people value different things' (p. 1440); even Aristotle makes mention of this capricious notion by saying that each man, or even the same man, may value different things at certain periods of his life depending on his health and/or wealth.

In relation to health, quality of life is defined in terms of difference between reality, or perception of reality, and expectations (3). Quality of life has also been referred to as an affective response to one's role situation and values (4). The World Health Organisation (WHO) has defined "Quality Of Life" as "*an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns*" (5). The WHO states that quality of life is affected by an interaction of the individual's health, mental state, spirituality, relationship and elements of their environment (5).

It is now recognized that quality of life extends beyond a strict medical discourse into areas such as sociology, psychology, environmental studies, social work and social policy. In the 1960s, social scientists became more interested in the issue of quality of living, and particularly in the relationship between economic and social indicators of life quality on one hand, and the subjective evaluation of these circumstances on the other (6). To define quality of life, social scientists have focused on objective (e.g. Income, housing, educational level) or subjective (e.g. happiness, life satisfaction, wellbeing) components of quality of life (7).

Many terms are used synonymously with quality of life in the literature such as happiness, life satisfaction, and subjective well-being.

Subjective well-being is composed of several components including global life satisfaction, contentment with specific life domains, the presence of frequent positive affect (pleasant moods and emotions), and a r elative absence of negative affect (unpleasant moods and emotions). Three main components of subjective well-being (SWB), namely pleasant (positive) affect, unpleasant (negative) affect and life satisfaction have been distinguished by researchers (8, 4, 9, 10, 11, 12). In this classification, life satisfaction represents a global cognitive evaluation or judgment of one's satisfaction with his/her life. Thus, SWB may be described as being the product of cognitive evaluations of life experience set on an affective background. According to this view, life satisfaction can be viewed

as an attitude: "a summery evaluation of objects along a dimension ranging from positive to negative" (13).

Positive and negative affect have been defined as the frequency of emotional responses such as feeling of happiness and sadness. Positive affect has been defined as "the extent to which one is non-specifically experiencing a positive mood, such as feeling of joy, interest, energy, enthusiasm, or alertness" (14). Negative affect has been defined as "the extent to which one is non-specifically experiencing a negative or aversive mood such as feeling of nervousness, sadness, irritation, guilt, contempt, or disgust". Non-specificity of mood was included in the definitions due to findings of large correlations between similarly valence affects (14).

Researchers have differentiated affect frequency from affect intensity (15). While positive and negative affect intensity levels are positively correlated, positive and negative affect frequency levels are negatively correlated (15). In addition to affect frequency, the primary cognitive component of subjective well-being (life satisfaction) must be considered in order to determine one's overall level of SWB. In sum, based on distinct nature of positive affect, negative affect and life satisfaction, it is suggested that each component of subjective well being be examined separately (12).

The main aim of the current study was to evaluate a hypothesized model to assess quality of life and general health rating to compare two groups of healthy and unhealthy males.

Materials and Method

Participants

A sample of 103 voluntary male participants, based on their response to the following question from the WHOQOL-BREF questionnaire: "Are *you currently ill*? (Yes - No)", were divided into two groups: unhealthy (N=55) and healthy (N=48) respectively.

Instruments

WHOQOL-BREF and *the Depression Anxiety Stress Scale (DASS-42)* were used to assess satisfaction rating and negative emotions of depression, anxiety and stress.

The WHO's QOL scale (WHOQOL-BREF) was used to assess satisfaction with four domains of life: physical health, psychological, social relationships and environment support. The four domain scores are scaled in a positive direction, with a score range of 0-20, and with higher scores denoting higher satisfaction. It also includes one facet on overall quality of life and general health. The 42-item format of DASS was used to measure the negative emotional states of depression, anxiety and stress.

Statistical Analyses

In order to find how rating the WHOQOL-BREF and DASS scales is combined to produce an overall measure of quality of life and satisfaction with health rating, a *QOL-DASS model* was designed ; and the

strength of this hypothesized model of *QOL-DASS* was examined using structural equation modeling (Figure 1).

In this model, ellipses represent latent variables; WHOQOL, and DASS, and rectangles represent measured variables; satisfaction in four different domains of life, physical health, psychological well-being, social relations, and environment, as measured with WHOQOL-BREF and depression, anxiety, stress as measured with DASS-42.

Results

For analysis, a confirmatory factor analysis (CFA) ,using maximum likelihood, was conducted on a sample of 103 participants whose scores derived from two rating scales of WHOQOL-BREF and DASS-42.

Using AMOS and maximum likelihood estimation, the relationships were examined between the WHOQOL, a latent variable with 4 indicators of four domains concerning with satisfaction with physical health (DOM1), psychological well-being (DOM2), social relationships (DOM3) and environment support (DOM4) ;and another latent variable , DASS, with 3 indicators of depression, anxiety, and stress ratings. The dependent variables were overall life satisfaction and satisfaction with health ratings.

Model fit. Whether the model provides a good fit to the data could be assessed by goodness-of-fit indexes. The most commonly used goodness-of-life index is the chi-square statistic. The results of the run of the data obtained from the proposed model of QOL-DASS is presented in Table 1.
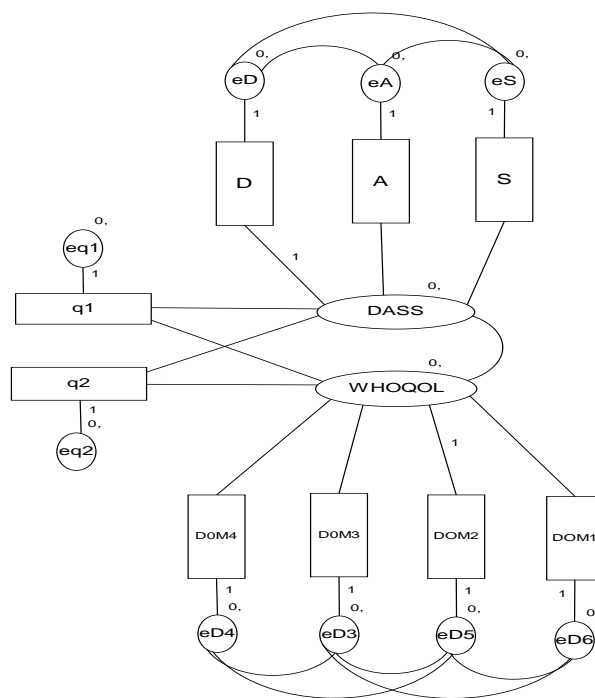

Figure 1. Model of QOL-DASS

Table 1. Fit Indices of the Model of QOL-DASS for different healthy and unhealthy groups

Groups	N	χ^2	df	χ^2/df	p	CFI	NNFI	NFI	RMSEA	PCLOSE	IFI	HOELTER .05	.01
Healthy	48	14.83	16	.927	.537	1.00	1.01	.94	.00	.66	1.00	84	102
Unhealthy	55	13.57	16	.848	.631	1.00	1.02	.97	.00	.75	1.00	105	128

χ^2= Chi-Square; df= degrees of freedom; CFI= Comparative Fit Index; NNFI= Non-Normed Fit Index; NFI= Normed Fit Index; RMSEA=Root Mean Square Error of Approximation; PCLOSE=Probability of Close Fit

Table 2. Regression Weights (B) and Standardized Regression Weight (β) coefficients

	Groups					
	Healthy			Unhealthy		
Pathways	B	β	p	B	β	p
WHOQOL $\rightarrow$ Physical Health (DOM1)	.654	.742	.001	.828	.824	.001
WHOQOL $\rightarrow$ Psychological Well-being(DOM2)	1.00	1.07	.001	1.00	.865	.001
WHOQOL $\rightarrow$ Social Relations(DOM3)	.890	.729	.001	.981	.698	.001
WHOQOL $\rightarrow$ Environment Support(DOM4)	.521	.648	.001	.819	.681	.001
WHOQOL $\rightarrow$ Quality of life (q1)	-.564	-1.98	.578	.136	.379	.495
WHOQOL $\rightarrow$ Satisfaction with health (q2)	-.740	-2.14	.594	.125	.365	.249
DASS $\rightarrow$ Depression	1.00	.707	.001	1.00	.569	.001
DASS $\rightarrow$ Anxiety	.823	.592	.001	.778	.580	.001
DASS $\rightarrow$ Stress	.647	.456	.001	.758	.509	.001
DASS $\rightarrow$ Quality of life (q1)	-.346	-2.48	.465	-.055	-.367	.369
DASS $\rightarrow$ Satisfaction with health (q2)	-.415	-2.45	.508	-.034	-.254	.320

Table 3: Goodness-of-Fit Statistics for Tests of Invariance across different groups

Model Description	Group	χ^2	df	$\Delta\chi^2$	Δdf	CFI	RMSEA	p-value
Unconstrained	Healthy/Unhealthy	29.23	32	-	-	1.00	.04	-
Regression weights	Healthy/Unhealthy	37.18	41	7.95	9	1.00	.05	ns

CFI= Comparative Fit Index; RMSEA=Root Mean Square Error of Approximation

As observed in Table 1 , for both the healthy and unhealthy groups, the χ2 statistic for the proposed model of QOL-DASS indicates that the proposed model fit the data well, which seemed to suggest an inadequate fit of the model. Moreover, other indicators indicated much more favorable results.

Table 2 provides estimated Regression Weights (B) and Standardized Regression Weight (β) coefficients of all pathways for the hypothesized model of QOL-DASS.

Testing for multiple group invariance
In order to find whether or not components of the measurement model (QOL-DASS model) are invariant across particular groups (here scores are derived from healthy and unhealthy persons) ,a multiple group analysis was conducted on the two groups. These groups varied depending on their response to a question (" Do you feel ill n ow? - The "No" response for the Healthy group; and the "Yes" response for the unhealthy group."). T he question is whether the relation between specific items (satisfaction with physical health (DOM1), psychological well-being (DOM2), social relationships (DOM3), environment

support (DOM4), depression, anxiety, and stress ratings.) and the underlying construct or factor (WHOQOL and DASS) tapped by the item is the same across groups.

The two models were proposed in order to compare the differences between different groups. The "Unconstrained" model does not specify any constraints on groups of healthy and unhealthy participants, and the "Measurement weights" model specifies all the factor loadings as equal on the different studied groups. Fit statistics were compared between the Unconstrained and Measurement weights models. Fit indices as well as the change in χ2 , and change in degrees of freedom between "Unconstrained" and "Measurement weights" models are presented in Table 3.

As demonstrated in Table 3 , the comparison of models, Unconstrained and Measurement weights, was found to be non-significant across Healthy/Unhealthy groups (Δχ2 = 7.95, Δdf = 9, ns. Given this finding, it can be concluded that the factor loading is shown invariant across the studied groups.

Discussion

George & Bearon, (16), define quality of life in terms of four underlying dimensions, two of which are

objective (General health and Functional status and Socioeconomic Status) and two of which reflect the personal judgment of the individual (life satisfaction and related measures and self-esteem and related measures) , and believe that these dimensions are especially central for assessment of quality of life of older people (16.(

Although the boundary between subjective and objective components of QOL is not always clear in practice, measures of quality of life are based on both objective and subjective variables (17). Meeberg (1) referring to subjective and objective components of quality of life, claimed that the subjective aspect is essential because a s ense of personal satisfaction is intrinsic to QOL and the objective component is also necessary. A person living in poverty and squalor who has never known any other way of life may feel satisfied with his or her life. Yet, a person from outside those living conditions can see the prevailing health hazards and would evaluate that individual's QOL as less than ideal (1).

In order to find how subjective evaluation of satisfaction with life domains and feeling negative emotions affect perceived general health and quality of life, a hypothesized model of QOL-DASS was designed, and the strength of this hypothesized model was examined using structural equation modeling (see Fig. 1).

Our results of running the hypothesized model of QOL-DASS indicated that the proposed model of QOL-DASS fitted the data well for both healthy and unhealthy groups (see Table 1). We continued our analysis by testing for multiple group invariance to find whether or not components of the measurement model, QOL-DASS model, are invariant across the two groups. Our results of conducting multiple group invariance across the groups of healthy and unhealthy indicate that all factor loadings across different groups used to be invariant (Table 3) . As the baseline (Unconstrained) and Regression weights models are not significantly different, it is concluded that the hypothesized model of QOL-DASS is invariant between the two groups.

Our findings to evaluate the hypothesized model of QOL-DASS

indicate that the different satisfaction domain ratings obtained from WHOQOL-BREF and the negative emotions (depression, anxiety and stress measured using DASS-42 as the observed variables) can represent the underlying constructs of general health and quality of life on both healthy and unhealthy groups.

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