**Review Article**

# Responsiveness of instruments for assessing quality of life of Ferrans & Powers: a literature review

*Responsividade dos instrumentos de avaliação de qualidade de vida de Ferrans & Powers: uma revisão bibliográfica*

*Receptividad de los instrumentos de evaluación de la calidad de vida de Ferrans & Powers: una revisión bibliográfica*

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## ABSTRACT

This objective of this study was to review literature on the responsiveness or sensitivity to changes of Ferrans & Powers instruments (IQVFP), for assessing quality of life (QV) using both the generic and specific versions. The articles were identified using the databases PubMed / Medline, Lilacs and SciELO and the electronic site of the authors, using the keywords: *quality of life, responsiveness, sensitivity to change, Ferrans and Powers Index,* and *measurement tool*. Of the 31 articles identified, 20 were assessed in full. As to the objectives, 85% were related to QV and interventions, and 15% about responsiveness, mostly developed with cardiac patients (11/55%). Among the three studies of responsiveness, two tested the psychometric properties of reliability and responsiveness. The other was a literature review. It was concluded that the number of studies that tested the responsiveness of the instruments IQVFP is low, requiring new studies to assess this property of measurement.

**Keywords:** Quality of life;Health status indicators;Heart diseases; Evaluation/menthods; Review

## RESUMO

Este estudo objetivou realizar uma revisão bibliográfica sobre a responsividade ou sensibilidade às mudanças dos instrumentos de avaliação de qualidade de vida de Ferrans & Powers (IQVFP), nas versões genérica e específica. Os artigos foram localizados por meio das bases de dados Pubmed/Medline, Lilacs e SciELO e no próprio sítio eletrônico das autoras, utilizando as palavras-chaves: *quality of life, responsiveness, sensitivity to change, Ferrans and Powers Index, measure tool.* Dos 31 artigos encontrados, 20 foram acessados na íntegra. Quanto aos objetivos, 85% relacionavam QV e intervenções e 15% sobre responsividade, sendo a maioria desenvolvida com pacientes cardíacos (11/ 55%). Dentre os três estudos sobre responsividade, em dois foram testadas as propriedades psicométricas de confiabilidade e responsividade. O outro tratava de revisão de literatura. Concluiu-se que o número de pesquisas que testou a responsividade dos instrumentos de IQVFP é reduzido, havendo necessidade de novos estudos que avaliem essa propriedade de medida.

**Descritores:** Qualidade de vida; Indicadores básicos de saúde; Cardiopatias; Avaliação/métodos; Revisão

## RESUMEN

En este estudio se tuvo por objetivo realizar una revisión bibliográfica sobre la receptividad o sensibilidad a los cambios de los instrumentos de evaluación de calidad de vida de Ferrans & Powers (ICVFP), en las versiones genérica y específica. Los artículos fueron localizados por medio de las bases de datos Pubmed/Medline, Lilacs e SciELO y en el propio sitio electrónico de las autoras, utilizando las palabras-clave: *quality of life, responsiveness, sensitivity to change, Ferrans and Powers Index, measure tool.* De los 31 artículos encontrados, 20 fueron accedidos en su totalidad. En cuanto a los objetivos, el 85% relacionaban CV e intervenciones y el 15% sobre receptividad, siendo la mayoría desarrollada con pacientes cardiacos (11/ 55%). De los tres estudios sobre receptividad, en dos fueron comprobadas las propiedades psicométricas de confiabilidad y receptividad. El otro trataba de revisión de literatura. Se concluyó que el número de investigaciones que probó la receptividad de los instrumentos de ICVFP es reducido, habiendo necesidad de nuevos estudios que evalúen esa propiedad de medida.

**Descriptores:** Calidad de vida; Indicadores de salud; Cardiopatías; Evaluación/métodos; Review

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## INTRODUCTION

In the last few decades, Quality of Life (QoL) has been widely discussed in all areas of knowledge, especially, in the health area. Currently, Health-Related Quality of Life (HRQL) is considered one of the most important result measures in clinical studies[1], for it assists in the decision making process to choose among different treatments, and allows the success of new therapies or interventions to be monitored, considering patients' perception. Moreover, the HRQL assessment helps direct an action planning that leads to the improvement of life conditions[2].

Many instruments have been developed all over Europe and the United States of America (USA), aiming at measuring HRQL. Such instruments can be classified as: generic, when they assess the impact of diseases on patients' lives, and can be applied to several groups or populations; or specific, when they specifically assess certain aspects of the HRQL, providing a higher level of awareness towards detecting improvements or declines with regard to the studied aspect[3]. The specific instruments are, therefore, clinically sensitive and can be more responsive than the generic instruments[3].

When developing QoL assessment instruments, there is a consensus about how important it is to test some psychometric properties - reliability and validity - before using them as measures of the results in clinical studies[1,3].

Reliability is related to the consistency with which the instrument measures the attribute[4]. It indicates whether measures can be reproduced, that is, whether they have the ability to repeatedly find the same results when applied to stable subjects[3]. The lower their variation achieving repeated measurements of an attribute, the higher their reliability[4].

Instruments are considered valid according to which degree they measure what they are supposed to[3-4]. For example, a valid instrument to measure intelligence must measure intelligence, not memory.

In order to assess HRQL changes throughout time - due to a surgery, medication therapy, procedure or treatment - a third property has been proposed by researches: responsiveness[1].

Responsiveness, also known as *sensitivity to changes*, is the ability instruments have to measure small changes that are clinically important, where subjects respond to effective therapeutic interventions. This is considered an important part of the longitudinal constructs assessment process[5]. In intervention studies, incorrect result assessments can occur when non-sensitive instruments are used.

In a literature review on responsiveness, the authors[1] found several definitions, classified in three groups, according to the type of change the responsive instrument is able to detect: ability to detect changes in general, but not considering if the change is relevant or significant; ability to detect changes that are clinically important, and ability to detect a real change to the concept that is being measured[1].

### Ferrans & Powers Quality of Life Index

Ferrans & Powers Quality of Life Index (FPQLI) was developed by the nurses Carol E. Ferrans and Marjorie Powers, professors of the University of Illinois (USA), in 1984. FPQLI, generic version I[6] includes 18 areas, defined through 32 items, distributed in four domains: Health and Function (HF), Psychological/ Spiritual (PS), Socioeconomic (SE) and Family (Fam). Its structure is divided into two parts: the first one, destined to the assessment of the satisfaction with life, and the second, to assess the importance given by the individual to each item[6-8]. Both are comprised of the above mentioned 32 items, which leads to a duplication of the number of questions to be answered[6-7]. The original version I was translated and adapted into Portuguese[9], with patients who had been released from intensive care units, since its original publication[6]. The latest version, called generic III, dates from 1998[10].

Beyond the versions Generic I and III, there are several specific versions of the FPQLI: Cancer III, Cardiac IV, Chronic Fatigue Syndrome III, Diabetes III, Dialysis III, Epilepsy III, Liver Transplant III, Multiple Sclerosis III, *Nursing Home* III, Pulmonary III, Medular Injury III, Sickle cell A III, Vascular Accident III[11], and more recently, Brazilian authors developed the FPQLI wound version (FPQLI-WV)[12].

Considering the relevance of the responsiveness as a pyschometric measure in QoL assessment instruments, and due to the fact Ferrans and Powers Quality of Life Index is more and more utilized in healthcare, the present bibliographical review was developed, aiming at identifying and analyzing evidence on this item with regard to FPQLI, in the generic and specific versions.

## METHODS

Articles included in the present bibliographical review, had to meet the following criteria: to be related to the theme "responsiveness", to use FPQLI, generic and specific versions, to have been published in an indexed national or international journal, and to be in English, Portuguese or Spanish. Publications included complete articles, summaries, reviews, editorials and letters. Articles in other languages were excluded, as well as articles that could not be accessed electronically or through printed magazines that were part of the collection of the libraries.

Data collection was carried out in June 2010, through the databases Pubmed/Medline, Lilacs, SciELO, and

Ferrans and Powers' electronic website[11], using the following key-words: *qualidade de vida, responsividade, sensibilidade para mudança, índice Ferrans e Powers, instrumento de medida* (in Portuguese) and quality of life, responsiveness, sensitivity to changes, Ferrans and Powers Index, measure tool (in English).

## RESULTS

Thirty-one research articles were found on the proposed theme, 27 of which were in the authors' website[11]. From the 31 articles identified, 20 were accessed and are part of the present review, according to the data presented in Table 1. Articles were excluded according to the following: incorrect references, older articles, not electronically available, or articles in printed magazines that were not part of the collection of the libraries.

According to this bibliographical review, the first publication of FPQLI was released in 1989, reaching a peak of publications in the year 2000 (4/20%) and 2004 (3/15%). Sixty-five percent of the researches were carried out in the United States of America, the authors' native country. The analyzed articles were published in 15 different journals, and the following can be highlighted: *Heart & Lung* (3), *Applied Nursing Research* and *Circulation*, with two publications each. As to the studies objectives, 85% (17) related QoL and interventions, and only 15% (3) of them were on responsiveness. From the articles that addressed

**Table 1 -** Articles on FPQLI responsiveness.

| Authors | Objective | Sample | Intervention | Instrument used | Statistical Analysis | Assessment/Follow up | Conclusion |
|---|---|---|---|---|---|---|---|
| Schron, Chung, Rocco, Lader, Constantine, Sheppard[13] | Study Intervention | 716 | two types of treatment to control the cardiac rhythm in the atrial fibrillation | Perceived Health/The Cantril Ladder of life/SF - 36/QLI Index/ | Test x2/Test t | Beginning, 2 months, 1, 2, 3, 4 years | QoL was similar for both groups |
| Verrill, Barton, Beasley, Lippard[14] | Study Intervention | 590 | Pulmonary rehabilitation program, short and long term | 6MV test/SF - 36/QLI Pulmonary Index Version - III/University California at San Diego shortness of breath questionnaire (SOBQ) | Effect Size | Beginning, 12 and 24 Weeks after | QoL improved 12 weeks after the intervention |
| Hamilton, Carroll [15] | Study Intervention | 70 | Cardioverter defibrillator implant in elderly and young individuals | SF-36/QLI Index/Profile of Mood States (POMS) | p value | 6 and 12 months after interv. | Young people's QoL improved, according to their perception. |
| Scott, Setter-Kline, Britton [16] | Study Intervention | 88 | Nursing support and education program on PAC with Ins. Cardiac | QLI - Cardiac Version III/SF - 36/Mental Health Inventory -5 | Paired t-test | Beginning, 3 and 6 months | Improvement of mental health and QoL after interv. In 6 months |
| Taylor [17] | Study Intervention | 47 | Rehabilitation program for patients with chronic fatigue | The chronic Fatigue Syndrome Screening Questionnaire/The Structured Clinical Interview for DSM-IV/The Chronic Fatigue Syndrome Symptom Rating Form/QLI Index | Effect Size/Co-variance | Beginning and 1 month after | Guided programs have positive impacts on the symptoms seriousness and QoL with time |
| DeSouza, Nairy[18] | Study Intervention | 60 | Educational program for individuals with diabetes | QLI - Version II Individual with diabetes | p value | 1 day before the interv. 30 and 60 days after | Significant improvements to the QoL after interv. |
| Smith, Shortnesss, Kleinbeck, Werkowitch, Mosier, Seidner et al.[19] | Study Intervention | 73 | Interactive videotape educational program for patients with Enteral Nutrition | QLI | X2/T-test / multivariate regression | 6 and 18 months | Improvement of the QoL after 18 months |

Continuation...

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| Authors | Objective | Sample | Intervention | Instrument used | Statistical Analysis | Assessment/ Follow up | Conclusion |
|---|---|---|---|---|---|---|---|
| Arora, Chou, Jain, Fleishman, Crawford, McKiernan et al[20] | Study Intervention | 71 | Enhanced External Counterpulsation for angina (EECP) | SF-36/(QLI - Version III) | p value/paired t-test | Beginning, 12meses after inter. | Significant QoL after 12 months |
| McEntee, Badenhop[21] | Study Intervention | 232 | Cardiac and Pulmonary rehabilitation program | QLI - Pulmonary Version and Cardiac Version | T-test Student | Before and after the rehabilitation, and at the end of every week for 12 weeks | More women in pulmonary and cardiac rehabilitation reported QoL improvement during the program than men. |
| Brooks[22] | Study Intervention | 106 | Having stayed in the ICU | QLI / The Global Quality of Life Scale | Wilcoxon | During the ICU stay and after the ICU release | Patients reported QoL improvement after the ICU release. |
| Robinson-Smith Johnston, Allen[23] | Study Intervention | 63 | Rehabilitation program for post-AVE patients | Strategies Used by People to Promote Health/QLI Index-Version AVC/Center for Epidemiologic Studies Depression Functional Scale/ Independence Measure | Pearson's Correlation Coefficient | 1 and 6 months after stroke | Self-care and self-efficency are strongly related to QoL and depression. |
| Arora, Chou, Jain, Nesto, Fleishman, Crawford et al.[24] | Study Intervention | 125 | Enhanced External Counterpulsation for angina (EECP) | SF-36/(QLI - Version III) | p value | Beginning, 3, 6, and 9 weeks after interv. | significant QoL increase after 6 months |
| Jenkins, Ellenbogen, Kay, Giudici, Bubien, Martin et al.[25] | Study Intervention | 161 | Radio frequency ablation | SF-36/(QLI - Version III) | p value | pre-ablation, 3 and 12 FALTA VÍRGULA? months after interv. | QoL improvement in 3 months, prolonged for 12 m |
| LoBiondo, Williams, Wood, Shaw Jr[26] | Study Intervention | 45 | Liver transplant | QLI - Liver Transplant Version | p Value for the variance analysis | Pre-Tx 3, 6, 12 and 18 months after | QoL improves significantly with time |
| Bliley, Ferrans[27] | Study Intervention | 40 | Coronary Angioplasty | QLI | Paired t-test/Pearson's Correlation Coefficient | before interv., 4 and 6 weeks after interv. | Angioplasty significantly improved QoL |
| Hixon[28] | Study Intervention | 15 | Valvuloplasty | QLI Index - Cardiac Version III | Paired t-test | before interv., an 4 weeks after interv. | QoL improvement after intervention |
| Kolz N.[29] | Study Intervention | 30 | Bypass cardiac surgery | QLI | Not described | immediately after surgery and 6 months after | QoL demonstrated to be improved immediately after surgery, with a reduction after 6 months |
| Buck, Jacob, Massey, Ford[30] | Study responsiveness - Literature Review | 15 | Without Intervention | Frenchay Activities Index/Niemi QOL Scale/Ferrans and Powers QOL Index-Version CVA/Stroke-Adapted Sickness Impact Profile | - | - | No responsiveness presented |
| Flemons, Reimwé[31] | Study responsiveness | 90 | Use of CPAP in patients with sleep apnea | SF-36/QLI Index/Calgary Sleep Apnea QLI | Effect Size | Before the treatment and after 4 weeks | High responsiveness in the Calgary Sleep Apnea QLI |
| Dougherty, Dewhust, Nichol.[32] | Study responsiveness | 107 | Anti-angina medication therapy | Seatle Angina Questionaire (SAQ) /S-36/ QLI Cardiac Version | Paired t-test | 30 in 30 days, total of 3 months | No responsiveness presented |

responsiveness, only two of them tested it beyond reliability[31-32], and the third article was a literature review. With regard to the studied samples, the majority was of cardiac patients (11/55%), and the other ones were: cerebral vascular disease (2), diabetes (1), pulmonary disease (1) and others (5). With regard to the authors of the studies, nurses are present in 11 of them (55%). As to FPQLI version used in these studies, most of them were the generic instrument QLI - versions I and III, with 28,6% each. Regarding specific instruments, the QLI, cardiac version (3) and AVE version were used With regard to the statistical analyses in the studies, 6 (27.3%) used the paired t-test, and 3 (13.5%), effect size. Only 5 (22.3%) of them mentioned the p value.

## DISCUSSION

Most of the articles reviewed by this study was found in the website of the authors[11] who developed the QLI, and were classified as responsiveness studies. However, when analyzed, only two articles[31-32] actually addressed responsiveness. As to the remaining articles, although QoL related-interventions were described, they do not address responsiveness results specifically, that is, as a psychometric property of the instrument, differently from the validation studies. Even though these studies were not responsiveness studies, their data are also on Table 1 for those who use the Ferrans & Powers instruments, which are widely used in Brazil.

One of the studies, which analyzed the FPQLI responsiveness[31], investigated the QoL of 90 patients diagnosed with sleep dyspnea who continuously used the *bipap*. In the present study, the following instruments were used: *Calgary, Sleep Apnea Quality of Life Index (SAQLI)*, as a specific disease instrument, and SF-36 and FPQLI, as generic instruments. The instruments were applied at two moments: before and after the treatment. Reliability, validity and responsiveness were analyzed as psychometric properties. In order to analyze responsiveness, the paired t-test and effect size were used. In this study, the *SAQLI* demonstrated high responsiveness in relation to the instruments SF-36 and FPQLI.

Another investigation tested the psychometric properties of reliability and responsiveness[32]. The present research intended to compare the reproductiveness and responsiveness of three quality of life instruments: *Seattle Questionnaire Angina (SAQ)*, *Quality of Life Index Cardiac Version III (QLI)* and *SF-36*. One hundred and seven patients with unstable angina participated in the study, where two types of medicine were analyzed (a long-acting, which was administered once a day and a fast-acting one, which was administered more than once a day) as well as their association with QoL improvement. QoL instruments were applied at the beginning of the treatment, two weeks and three months after the beginning. In order to analyze responsiveness, the researchers used the paired t-test, with a 5% level of significance. In this study, all the QoL instruments demonstrated satisfactory reliability. With regard to the responsiveness, the FPQLI, cardiac version III was not able to detect changes to the QoL, thus not confirming this important measure property.

With regard to the responsiveness calculation method, both studies used the paired t-test, and the second study also used effect size. The literature describes several ways to test responsiveness, but no consensus is reached among the studies. A review found 31 indexes used in studies to calculate responsiveness, among which, *effect size* can be highlighted. Another study[33] mentions the paired t-test as the most used statistics to calculate responsiveness, as well as both mentioned publications[31-32].

## CONCLUSION

The results of this bibliographical review show that only a small number of researches tested Ferrans & Powers QoL instrument responsiveness, although several researches were classified as such in the website of the authors who created the instrument. Considering that the validity of a given measurement instrument is not definitively proven, but supported by the accumulation of evidence, there is a need for new studies that assess the psychometric properties, mainly responsiveness.

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