Factor analysis of the Health-Related Quality of Life indicators of the QLQ-C30 in 6798 cancer patients.

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Background:
When treating cancer patients, preservation of quality of life is an important goal. There is an emerging consensus that quality of life should be one of the endpoints in clinical trials. The specific aim of this study was to explore the underlying factor structure of the 15 Health-Related Quality of Life (HRQoL) indicators and to generate hypotheses about the inter-relationships of the indicators.

Material and methods:
Pooled data from 6798 patients on 29 European Organisation for Research and Treatment of Cancer (EORTC) randomized clinical trials were used for this analysis. Principal Factor Analysis was performed to extract factors from the 15 HRQoL indicators. An oblique rotational technique (Harris-Kaiser) was used. Cronbach's alpha coefficient (α) was calculated to measure internal consistency. Validity of results was evaluated by using clinical parameters World Health Organisation (WHO) performance status (0-1 vs 2-3) and metastases status (no vs yes) to divide the patients into subgroups that were expected to differ in HRQoL. Subgroups were compared using the t-test, with response variables being the obtained factors.

Results:
Two main factors emerged from the analysis. The first factor had high loadings from 8 of the 15 indicators: physical functioning, role functioning, emotional functioning, cognitive functioning, social functioning, global health status, fatigue and pain. This factor appears to describe a 'general functioning' status. The second factor had high loadings from 2 of the 15 indicators: nausea and vomiting and appetite loss. This factor appears to describe a 'gastrointestinal functioning' status. Internal consistency was α=0.87 for the 'general functioning' factor and α=0.68 for the 'gastrointestinal functioning' factor. Both factors were able to detect differences in subgroups defined according to WHO performance status ($p=0.0008$ for the 'general functioning' factor, $p<0.0001$ for the 'gastrointestinal functioning' factor) and to metastases status ($p<0.0001$ for the 'general functioning' factor, $p<0.0001$ for the 'gastrointestinal functioning' factor).

Conclusions:
Factor scores are useful to monitor quality of life in patients. Patient assessed HRQoL indicators have demonstrated prognostic power; summary indexes of HRQoL indicators should be employed as stratification variables alongside conventional variables. This approach may also allow simplification of data and analysis in clinical trials.