

# Domain attrition in the IWQOL series and the challenges of factor-only item reduction

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## Summary

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- The IWQOL quality of life measure was progressively shortened from 74 items across 8 domains (1995) to just 20 items across 2 domains (2019), with 58% of items removed based purely on statistical criteria rather than patient input.
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- Important patient-relevant domains were eliminated during shortening, including appetite control, eating enjoyment, daily self-care, and weight-related stigma - concepts that remain highly relevant to patients' experiences with obesity.
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- Relying solely on statistical methods to shorten measurement tools (e.g. item reduction to fit a predetermined size) can remove clinically important content that matters to patients, potentially reducing the tool's ability to detect meaningful treatment benefits.

## Background

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- Progressive shortening of patient-reported outcome measures (PROMs) is often driven by **factor-analytic item reduction with limited patient input**.
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- Using the Impact of Weight on Quality of Life (IWQOL) family as a case study, we explored how successive refinements—from the **74-item IWQOL (1995)<sup>1</sup>** to the **31-item IWQOL-Lite (2001)<sup>2</sup>**, the **22-item IWQOL-Lite-Clinical Trials version (IWQOL-Lite-CT, 2017)<sup>3</sup>**, and finally the **20-item IWQOL-Lite-CT (2019)<sup>4</sup>**—alter domain coverage and the potential clinical meaning that is retained or lost.

### IWQOL (1995) 74 items & 8 domains

Health (14 items)
Social (11 items)
Mobility (10 items)
Self-esteem (10 items)
Comfort with food (9 items)
Work (7 items)
Daily activities (7 items)
Sexual life (6 items)

### IWQOL-Lite (2001) 31 items & 5 domains

Physical function (11 items)
Self-esteem (7 items)
Public distress (5 items)
Work (4 items)
Sexual life (4 items)

### IWQOL-Lite-CT (2017) 22 items & 2 domains

Psychosocial (13 items)
Psychosocial (9 items)

### IWQOL-Lite-CT (2019) 20 items & 2 domains

Psychosocial (13 items)
Psychosocial (7 items)

#### IWQOL (1995)<sup>1</sup>:

- Clinical interviews were conducted among people with obesity; seventy-four items were developed, reflecting the most common concerns. These were subsequently tested for clarity and modified based on feedback from other patients and divided into 8 domains.

#### IWQOL-Lite (2001)<sup>2</sup>:

- Developed in 2001 to address concerns about the length of the IWQOL and the resulting response burden associated with its use in clinical trials.
- Item selection, wording and reduction was completed on the basis of **statistical methods and psychometric analysis only**.

#### IWQOL-Lite-CT (2017)<sup>3</sup>:

- To increase the relevance of the IWQOL-Lite to clinical trial samples, and for increased consistency with the FDA guidance relating to claims in medical product labels based on PROMs, Kolotkin et al. (2017) developed the IWQOL-Lite-CT.
- Concept elicitation interviews were conducted with patients, including open ended general questions as well as review of the IWQOL-Lite concepts. Resulting items were selected and/or modified from IWQOL-Lite, or added de novo.

## Results

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- The original IWQOL captured eight domains and 74 items derived from interviews with  $\approx$ 20 patients.
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- IWQOL-Lite retained only five domains: Physical Function (11 items), Self-Esteem (7), Sexual Life (4), Public Distress (5) and Work (4), removing Health, Social/Interpersonal, Activities of Daily Living and Comfort with Food. 58% of items were discarded solely on statistical grounds.
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- IWQOL-Lite-CT initially comprised 22 items, which were further reduced to 20 items (2019) spanning two broad domains: Physical (7) and Psychosocial (13). Notably, the final refinement eliminated two stigma-related items based on statistical redundancy.
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- Although cognitive interviews informed wording, the earlier omitted domains were not restored; nuanced and salient concepts such as appetite control, eating enjoyment, day-to-day self-care, and weight-related stigma remain absent.

## Conclusions

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- The IWQOL trajectory illustrates how **psychometric Procrusteanism can lead to the removal of content that matters to patients**.
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- When PROMs are shortened without patient input, clinically-salient domains may disappear, potentially undermining sensitivity to modern treatment benefits.
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- Future instrument refinement should combine **statistical criteria with iterative patient engagement**.

#### References:

1. Kolotkin, RL et al. 1995. Assessing Impact of Weight on Quality of Life. *Obesity Research*; 3(1): 49-56. doi: 10.1002/j.1550-8528.1995.tb00120.x.
2. Kolotkin RL et al. 2001. Development of a brief measure to assess quality of life in obesity. *Obesity Research*; 9(2): 102-11. doi: 10.1038/soby.2001.13.
3. Kolotkin RL et al. 2017. Development of a clinical trials version of the Impact of Weight on Quality of Life-Lite questionnaire (IWQOL-Lite Clinical Trials Version): results from two qualitative studies. *Clinical Obesity*; 7(5): 290 - 299. doi: 10.1111/cob.12197.
4. Kolotkin RL et al. 2019. Validation of a new measure of quality of life in obesity trials: Impact of Weight on Quality of Life-Lite Clinical Trials Version. *Clinical Obesity*; 9(3): e12310. doi: 10.1111/cob.12310. Epub 2019 Apr 16.