Evaluation of Construct and Structural Validity in the Patient Roles and Responsibilities Scale

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1. Background and Scale Overview

The Patient Roles and Responsibilities Scale (PRRS) was developed to enable a broader evaluation of the impact of cancer and its treatment, measuring 'real world' concerns such as caring for others, finances and employment.

The PRRS Scale has been developed and evaluated in 4 stages and is part of the FACIT measurement system (www.facit.org).

Stage 1
- Systematic review of existing PROMs validated in cancer patients[1]

Stage 2
- 2 qualitative interview studies to inform questionnaire development[2]

Stage 3
- Preliminary evaluation and validation of new scale[3]

Stage 4
- Further evaluation and validation in different study population

It is intended to be used alongside generic Health Related Quality of Life measures such as the FACT-G but could also be utilised alongside the EORTC QLQ-C30.

The PRRS comprises 16 core items in 3 subscales, identified with Principal Components Analysis in Stage 3[3].

These core subscales are:

Responsibilities and Social Life (α=0.84)

Family Wellbeing (α=0.87)

Financial Wellbeing (α=0.79)

The scale includes items such as:

I am less able to fulfil my caregiving responsibilities (e.g. looking after children, grandchildren, another adult, pets)

I have difficulty meeting the additional costs of my illness

A standalone subscale, Jobs and Career, is completed only by patients in current employment (including long term sick-leave).

Initial evaluation showed the PRRS to be psychometrically robust.[3]

This study examined the structural and construct validity of the measure using a new set of patients.
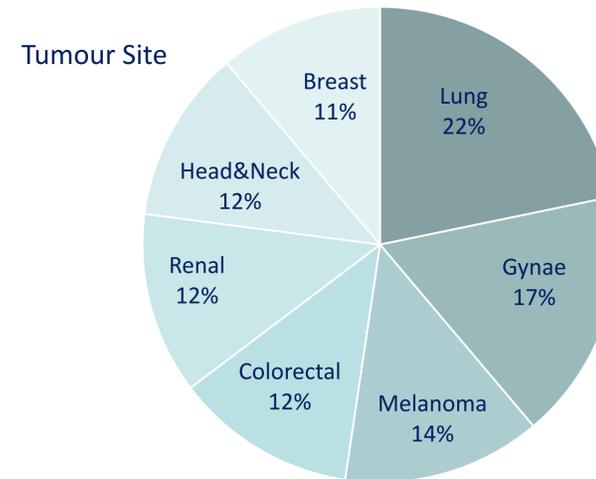
2. Methods

Measures and procedure:

- Participants completed questionnaires at home, on paper or online depending on preference
- Validation pack comprised the PRRS, FACT-G, Social Difficulties Index (SDI) and WHOQOL-BREF
- Measures were completed at baseline, 7 days (test retest, PRRS only) and 2 months (sensitivity to change)
- Baseline data were analysed to evaluate the structural and construct validity

Analysis:

- Criterion validity assessed by correlation with the SDI (total and comparable subscale scores)
- Convergent validity assessed through correlation with FACT-G and WHOQOL-BREF
- Confirmatory Factor Analysis (R 3.5.1; Lavaan package) tested a three-factor model estimated with robust (Huber White) maximum likelihood CFA

3. Participant Characteristics

- 184 patients from 13 English cancer centres consented to take part; 170 completed baseline questionnaires

Tumour Site

- Lung 22%
- Gynae 17%
- Melanoma 14%
- Colorectal 12%
- Renal 12%
- Head&Neck 12%
- Breast 11%

- Age ranged from 27-92 (median 60 years)
- 98 (58%) female
- 53 (31%) stage I/II disease, 117 (69%) stage III/IV
- Time since diagnosis:
  - <1year 75 (44%)
  - 1-2 years 35 (21%)
  - >2 years 60 (35%)

4. Results

- Missing data on the PRRS scale were low (1.7%)
- Strong, negative correlations with SDI total (r=-0.76) and matched subscales demonstrate criterion validity:

    Responsibilities/Everyday Living (r=-0.78)

    Family Wellbeing/Self and Others (r=-0.55)

    Financial Wellbeing/Money Matters (r=-0.65)

- Strong positive correlations with FACT-G (r=0.75) and WHOQOL-BREF (r=0.72) demonstrate good convergent validity
- PRRS subscales showed good internal consistency:

    Responsibilities and Social Life (α=0.88)

    Family Wellbeing (α=0.89)

    Financial Wellbeing (α=0.83)

CFA model fit:

15/16 items loaded ≥ 0.6 on its latent variable (range 0.58-0.87) ☑

χ^2:df ratio = 2.2:1 (threshold was <3:1) ☑

SRMR = 0.07 (threshold was ≤0.08) ☑

RMSEA = 0.09 [90% CI 0.08, 0.11](threshold was ≤0.08) ☒

CFI = 0.89 (threshold was ≥0.9) ☒

TLI = 0.87 (threshold was ≥0.9) ☒

5. Summary and Conclusions

- The PRRS demonstrated good criterion and convergent validity and the subscales showed good internal consistency. The three factor CFA model did not meet all fit criteria and should therefore be reconsidered in a larger sample
- The standalone Jobs and Career subscale requires further validation; only 42/170 participants that completed baseline were in current employment, meaning the sample size was too small for reliability analyses
- The current analysis provides preliminary support for the construct validity of the PRRS. While the study is not large, the item to participant ratio is 1:9 suggesting the results are robust
- Further exploration of the factor structure with a larger data set is warranted. We will also investigate measurement invariance across groups (e.g. early stage or advanced disease), not possible in the current data set due to group size

6. Acknowledgements

References: 1 – Catt et al doi:10.1007/s11764-016-0580-1   2 – Shilling et al doi: 10.1007/s11764-017-0628-x   3 – Shilling et al doi:10.1007/s11136-018-1940-2

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