

---

# **Manual for the Work Stressors Scale - Paediatric Oncology (WSS-PO)**

**Suzanne Mukherjee  
Bryony Beresford  
Alan Tennant**

---

© SPRU, University of York 2012

ISBN 978-1-907265-19-8

All rights reserved. Reproduction of this manual by photocopying or electronic means for non-commercial purposes is permitted. Otherwise, no part of this manual may be reproduced, adapted, stored in a retrieval system or transmitted by any means, electronic, mechanical, photocopying, or otherwise without prior written permission of SPRU, University of York, UK.

For technical advice and consultation regarding the use of the WSS-PO, please contact:

 Dr Suzanne Mukherjee

SPRU

University of York

Heslington

York, YO10 5DD

UK

 +44 (0) 1904 321992

 [suzanne.mukherjee@york.ac.uk](mailto:suzanne.mukherjee@york.ac.uk)

## Acknowledgements

Work on the development of this measure was supported by a small project grant from Cancer Research UK (Grant Number C28901/A10114). We would like to acknowledge the contribution of our collaborators - Lesley Edwards, Susan George, Adam Glaser, Pilar Gonzalez-Grey and Kate Wurr, who have supported the research team throughout the project. We would also like to sincerely thank all the paediatric oncology staff who took part in the project, including our lead contacts, the research nurses, and administrative staff in each of the research sites who assisted with recruitment. Finally we are grateful to Fiona Aspinal, Annie Irvine and Patricia Sloper for assistance with stage 2 of the development of the measure.

# **Manual for the Work Stressors Scale**

## **- Paediatric Oncology (WSS-PO)**

**Suzanne Mukherjee**

SPRU

University of York, UK

**Bryony Beresford**

SPRU

University of York, UK

**Alan Tennant**

Psychometric Laboratory for Health Sciences

University of Leeds, UK

March 2012

# Contents

	<b>Page</b>
<b>1. Introduction</b>	1
<b>2. The Purpose of the WSS-PO</b>	1
<b>3. Theoretical Background to the Scale</b>	2
<b>4. The Development of the Scale</b>	2
<b>5. Administration of the Measure</b>	2
<b>6. Scoring the WSS-PO</b>	3
<b>7. Guidance on Use of the Frequency Response Option</b>	3
<b>8. Psychometric Properties of the Measure</b>	4
Content Validity	4
The Scaling Properties of the WSS-PO	4
Construct Validity	5
Test-Retest Reliability	5
<b>References</b>	6

## 1. Introduction

This manual is for researchers and clinicians interested in using the Work Stressors Scale—Paediatric Oncology (WSS-PO) for research or clinical practice. It describes the purpose of the WSS-PO, the theoretical background to the scale, how it was developed, administration and scoring of the measure, and its psychometric evaluation. The WSS-PO is freely available for non-commercial purposes. In order to use the WSS-PO you are required to complete a registration form and agree to the terms and conditions of use. This registration form is available from the SPRU website

<http://php.york.ac.uk/inst/spru/research/summs/LIPOP.php>). Once this form is returned to the WSS-PO Administrative Manager, you will be sent a downloadable copy of the WSS-PO, along with the Scale Score Guidance Notes.

## 2. The Purpose of the WSS-PO

The WSS-PO is a 60-item psychometric scale which assesses the perceived intensity of work-related stressors experienced by staff working in multi-disciplinary paediatric oncology teams during the past 6 months. The WSS-PO does **not** assess the response state of the individual. Staff who perceive their work to be stressful do not automatically go on to experience difficulties at work, such as burnout, poor mental health, absenteeism, or a desire to leave their job. Outcomes depend on a complex interaction between the situations and events experienced and the resources the individual has to deal with them.

The WSS-PO was developed for use with doctors, nurses, and non-clinical staff (social workers, play specialists and youth workers) in the UK. It can therefore be used to provide an overview of how stressful work is for these members of multi-disciplinary teams and to compare the experiences of these different staff groups. The WSS-PO has been **not** yet been validated for use with other members of the paediatric oncology team (for example, ancillary staff, radiologists, surgeons, and so on) or for paediatric oncology staff working in other settings (for example, shared care). It should therefore not be administered to these groups. Furthermore, it had not yet been adapted for use by paediatric oncology staff in other countries. Anyone wishing to adapt the measure for use with other staff groups/in others settings must seek permission from the measure developers and comply with guidance on how to go about the adaptation.

In addition to providing a Total score of the perceived intensity of work-related stressors, WSS-PO also provides three sub-scale scores measuring the perceived stressfulness of different aspects of work: 'The Ill Child', 'The Parent' and 'The Organisation'. These sub-scales scores can be compared, providing data on which domains staff perceive to be most stressful.

It is anticipated that WSS-PO will be used in research investigating the relationship between the perceived intensity of work-related stressors and staff outcomes (such as burnout, psychiatric morbidity, sickness absence and intention to leave) and as an outcome measure in studies evaluating the effectiveness of staff support interventions. In addition to using the scale scores, responses to the individual items within WSS-PO can be examined to identify which situations and events staff find most stressful. Such information may be particularly useful to those wishing to develop interventions to support staff.

### **3. Theoretical Background to the Scale**

The development of the WSS-PO was guided by the well-established transactional model of stress and coping<sup>(1, 2)</sup>. According to this model, nothing can be labelled as stressful unless it is appraised as such by the individual. This appraisal is influenced by the features of the event/situation and the resources (psychological, social, organisational factors) an individual has available to respond to it. In other words, working in paediatric and adolescent oncology is not inherently stressful, but depends in part on the internal factors which an individual brings to a situation, and as well as external or environmental factors. We therefore anticipate that individuals will vary in the situations/events they find stressful.

### **4. The Development of the Scale**

The WSS-PO was developed in line with recent recommendations regarding the development of subject-reported measures<sup>(3)</sup> and using modern psychometric techniques. Stages in the development process included (1) qualitative interviews with a purposive sample of paediatric oncology staff (n=32) drawn from two Principal Treatment Centres (PTCs) in England and a children's cancer charity to gather data on work-related stressors; (2) analysis of interview data to generate the item pool for the draft measure; (3) cognitive interviews to gather feedback on the draft measure (n=9); (4) a field test survey of the draft and comparator measures involving 203 paediatric oncology staff (115 nurses, 47 non-clinical members of staff, 40 doctors) drawn from seven PTCs across the UK and a children's cancer charity; (5) factor and Rasch analysis of the survey data to test the scaling properties of the measures and decide on the final item set; (6) preliminary assessment of the construct validity of the measure. Further details on the development of the measure are available from a research paper on the project<sup>(4)</sup>.

### **5. Administration of the Measure**

The WSS-PO is a 60-item paper and pencil questionnaire which is self-administered and takes approximately 20 minutes to complete. Given that the measure deals with potentially sensitive issues, respondents must complete it in private and be assured that the information provided will be treated as strictly confidential. In order to maintain confidentiality, respondents should not be required to put their name or any other

identifying information on the questionnaire. Instead, unique identifiers which are not personally revealing, such as code numbers, should be used.

## 6. Scoring the WSS-PO

The WSS-PO provides a sum score of the extent to which staff perceive their work to be stressful. In order to calculate this score, administrators should sum responses to the Perceived Intensity response option ('How stressful have you found this?'). Scores on the Frequency of Exposure response option should **not** be used ('How often have you encountered this situation?'). Guidance on how to use this Frequency of Exposure data is given in Section 7.

Each item in the Perceived Intensity scale of the WSS-PO is scored from 0-2 (perceived stressfulness: not at all=0; a little=1; a lot=2.). It follows that the total score ranges from 0-120, with a higher score indicating that work is perceived as more stressful. In addition, sub-scales scores for the stressfulness of three domains of work can be calculated: 'The Ill Child'; 'The Parent'; and 'The Organisation'. As each of the sub-scales has 20 items, sub-scale scores range from 0-40. The raw Total WSS-PO score and sub-scale scores provide ordinal level data. Before carrying out parametric analysis of the data, raw ordinal scores should be transformed to the interval scale. Further information on the items included in each sub-scale and transformations to the interval scale are provided in Scale Scoring Guidance Notes.

## 7. Guidance on Use of the Frequency Response Option

Cognitive testing revealed that respondents found it easier to report on how stressful they found a situation or event after they had reflected on how frequently they encountered it. It was therefore decided that each item should have two responses formats: (1) How often have you encountered this situation? (2) How stressful have you found it? *Only data regarding the perceived stressfulness of potential stressors should be collated to form a scale score.* There are two reasons for this. First, a sum score of exposure to potentially, but not necessarily, stressful situations is not thought to provide meaningful data. Second, the WSS-PO has been created on the basis of a Rasch analysis of the Perceived Intensity data. A Rasch analysis has **not** been performed on the Frequency of Exposure data and we therefore have no evidence that this data meets the requirements of conjoint measurement and can be summed together to form an interval level scale score.

Although the Frequency of Exposure data should not be summed together, it may be useful in clinical practice when making decisions as to how best to support staff. In these circumstances, we recommend that managers examine the WSS-PO data to determine which items are reported to be most stressful for staff (rank order according to percent reporting item to be 'a lot' stressful), and then examine the frequency with which staff

report encountering the top 10 most stressful items. This data can be used to make a more informed decision as which stressors to tackle in an intervention.

## 8. Psychometric Properties of the Measure

This section deals with the content validity of the measure, its scaling properties, construct validity and test-retest reliability.

### Content Validity

In line with recent recommendations on the development of subject-reported measures<sup>(3)</sup>, the items included in the measure are based on verbatim text extracted from qualitative interviews with paediatric oncology staff. Furthermore, cognitive interviews with paediatric oncology staff revealed that the items 'resonated' with them, reminding them of situations they had encountered at work and, as a result, completing the measure was appealing. In summary, the WSS-PO is grounded in the real-life experiences of paediatric oncology staff and has considerable content validity.

### The Scaling Properties of the WSS-PO

The scaling properties of the measure were tested using Rasch analysis. Rasch analysis is the formal testing of a scale against a mathematical measurement model developed by the Danish mathematician Georg Rasch<sup>(5)</sup>. The approach is now widely used both to construct new scales and review existing scales. It has been endorsed as a rigorous approach to measure development<sup>(6-8)</sup> because it looks beyond the overall functioning of the test (as is the case in classical response theory), to examine the response of an individual with a given ability/underlying trait to each item in the measure. The Rasch model (ideal) assumes that the probability of a given respondent affirming an item is a logistic function of the relative distance between the item location (that is, in the case of a stressors measure, the level of stress expressed by the item) and the respondent location on a linear scale (that is, the extent to which the person perceives work to be stressful). If the data fit the model, we have evidence of an interval level scale, and the Rasch analysis provides a transformation of the raw ordinal scores to the interval-level variable. Detailed guidelines on Rasch analysis are available<sup>(8, 9)</sup>.

The stages of the Rasch analysis were as follows:

- i. Exploratory factor analysis to provide an initial idea of likely dimensionality (The item-case ratio was insufficient for a substantive factor analysis).
- ii. Factor analysis output used to identify an item set or, if multidimensional, item sets to take forward to the Rasch analysis.
- iii. For each item set: Rasch analysis was used to test the validity and reliability of the item set and, based on outputs of analyses, revision of these item sets so as to yield item sets with psychometrically acceptable scaling properties.

**iv. Testing whether a total score can be obtained.**

A full report on the findings of the Rasch analysis is provided in a research paper describing the measure development <sup>(4)</sup>.

### **Construct Validity**

In order to provide a preliminary assessment of the construct validity of the WSS-PO, associations between the WSS-PO total and sub-scale scores and two comparator measures were examined using Spearman's Rho. In the absence of a 'gold standard' comparator, the comparators chosen were the Maslach Burnout Inventory – Human Services Survey (MBI-HSS)<sup>(11)</sup>; and the Health and Safety Executive's Management Standards Indicator Tool (HSE MS Indicator Tool)<sup>(12)</sup>. In line with expectations, moderate correlations were found between the WSS-PO and these comparator measures. A full report on the findings of this evaluation is available from the research paper describing the development of the measure <sup>(4)</sup>.

### **Test-Retest Reliability**

The final stage in the measure development process is to test the stability of the measure over time. Sites which had participated in Stage 1 of the study (qualitative interviews about work-related stressors) participated in this stage of the project. Recruitment packs consisting of a letter of invitation, the WSS-PO, and a staff support information leaflet were distributed on behalf of the research team. Following receipt of a completed questionnaire (Time 1), a second copy of the questionnaire was administered four weeks later (Time 2). This was posted directly to the member of staff by the research team. The response rate at Time 1 was 56 per cent (n=54). However, at Time 2, just 16 questionnaires were returned (30 per cent response rate). This was an inadequate sample size to measure test-retest reliability. Further research to assess the test-reliability of the measure will be undertaken as soon as possible.

## References

1. Lazarus, R.S. and Folkman, S. (1984) *Stress, Appraisal, and Coping*, Springer, New York.
2. Lazarus, R.S. (1999) *Stress and Emotion: A New Synthesis*, Free Association Books, London.
3. USA Department of Health and Human Services (2009) *Guidance for Industry. Patient – Reported Outcome Measures: Use in Medical Product Development to Support Labeling Claims*.
4. Mukherjee, S., Beresford, B., Tennant, A. (*submitted for publication*) The Work-Stressor Scale for Paediatric Oncology: The Development and Validation of a New Measure Using Rasch Analysis.
5. Hays, R.D., Morales, L.S. and Reise, S.P. (2000) Item response theory and health outcomes in the 21st Century, *Medical Care*, 38, 9, Supplement II: II-28-II-42.
6. Hobart, J.C., Stfen, J.C., Zajicek, J.P., Thompson, A.J. (2007) Rating scales as outcome measures for clinical trials in neurology: problems, solutions, and recommendations, *Lancet Neurology*, 2007, 6, 1094-1105.
7. Tennant, A. and Conaghan, P.G. (2007) The Rasch Measurement Model in rheumatology: what is it and why use it? When should it be applied, and what should one look for in a Rasch paper?, *Arthritis and Rheumatism*, 57, 1358-1362.
8. Pallant, J.F. and Tennant, A. (2007) An introduction to the Rasch Measurement Model: an example using the Hospital Anxiety and Depression Scale (HADS), *British Journal of Clinical Psychology*, 46, 1-18.
9. Fisher, W. (1992) Reliability Statistics. *Rasch Measurement Transactions*; 6 (3): 23
10. Maslach, C. and Jackson, S.E. (1996) *Maslach Burnout Inventory Manual*, second edition, Consulting Psychologists Press Inc., USA.
11. Cousins, R., Mackay, C.J., Clarke, S.D., Kelly, C., Kelly, P.J. and McCaig, R.H. (2004) 'Management standards' and work-related stress in the UK: practical development, *Work and Stress*, 18, 2, 113-136.
12. Schaufeli, W. and Enzmann, D. (1998) *The Burnout Companion to Study and Practice: A Critical Analysis*, Taylor Francis Ltd., London.
13. Maslach C., Leiter M., and Schaufeli WB. Measuring burnout. In *The Oxford Handbook of organizational Well Being*, Cooper C and Cartwright S (eds.) Oxford University Press: Oxford, 2008; 86-108.