An Australian Government Initiative

University of Wollongong

Measuring Faecal Incontinence in Australia

Study Aims

1. Obtain current prevalence estimates for faecal incontinence in a community population survey (N=3015) in Australia.
2. Assess the psychometric properties of the Wexner Faecal Continence Grading Scale and other faecal incontinence items that were included in the survey to assess prevalence.

Introduction

1. A need for current prevalence data for faecal incontinence in Australia
2. There is a need to assess the psychometric properties of faecal incontinence instruments because:
   - The development of instruments for the measurement of faecal incontinence is still at an early stage in psychometric terms
   - The absence of large scale studies and clinical data makes the selection of reliable and valid measures difficult
   - Issues surrounding the actual content of questionnaires and scoring systems are hotly debated

Study Materials

1. The Wexner Scale (Jorge and Wexner, 1993) was included in the survey as it is a commonly used faecal incontinence measure and was recommended by Thomas et al. (2006) in the (Australian) Continence Outcomes Measurement Suite Project.
2. Additional items, developed by a Urogynaecologist, included faecal urgency, frequency, soiling and bowel patterns – it was noted that the Wexner does not include an item on faecal urgency.

Survey and Participants

Sampled all locations throughout South Australia with 1,000+ inhabitants. Sampling from ABS collection districts, using a random starting point and every 4th dwelling

Response rate = 72%. 4,700 households were selected with 3015 interviews. The sample comprised a total of 1202 males and 1713 females

It should be noted that incontinence prevalence in the 75+ age group is probably underestimated as this survey only includes those in community residences

Methods

- For prevalence estimates the data was weighted by probability of selection and ABS 2001 census data to ensure representation
- For the psychometric analyses unweighted data was used for all adults over 18 years of age
- All faecal items were pooled for analysis
- Psychometric properties were initially examined using Classical Test Theory approaches. This included examination of item descriptive statistics, item endorsement and discrimination, item-total correlations, internal consistency reliability and exploratory factor analysis
- Modern Test Theory approaches (Item Response Theory) (IRT) were also used to examine item properties. IRT is used to find the model with the best fit to the data and is a process commonly used to shorten scales

Results 1: Item-Total Correlations

Corrected item - total correlations and Cronbach's alpha if the item was deleted for each item of the Wexner Scale

Item	Corrected Item - Total Correlation	Cronbach's Alpha if Item Deleted
(Leak Solid)	0.52	0.46
(Leak Liquid)	0.53	0.44
(Leak Gas)	**0.25**	**0.77**
(Wear Pad)	0.39	0.50
(Alter Lifestyle)	0.42	0.50

The internal consistency for the Wexner was found to be low at 0.57. This above table shows that the (leak gas) item has a low corrected item - total correlation, just above the acceptable range of 0.20 (Streiner and Norman, 2003). The Cronbach's alpha data also suggests that if the leak gas item were deleted then Cronbach's alpha moves to an acceptable level of 0.77.

Procedure: Exploratory Factor Analysis

The method of exploratory factor analysis used was principal components analysis for extraction (eigenvalues > 1.00) with varimax rotation.

Rotated Factor Matrix: Faecal Incontinence

Rotated Factor Matrix for the Wexner and other items

	Factor		
	1	2	3
1 (Bowel Pattern)	0.27	**0.59**	-0.12
2 (Bowel Movements)	0.08	-0.03	**0.95**
3 (Urgency)	0.20	**0.70**	0.33
4 (Leak Solid)	**0.71**	0.22	0.07
5 (Leak Liquid)	**0.75**	0.31	0.10
6 (Leak Gas)	0.08	**0.74**	-0.08
7 (Leak Stool / Urgency)	**0.77**	0.25	0.06
8 (Wear Pad)	**0.71**	-0.03	-0.06
9 (Leak / Change Underwear)	**0.78**	0.18	0.06
10 (Alter Lifestyle)	**0.70**	0.15	0.09

Wexner = items 4 + 5 + 6 + 8 + 10

The exploratory factor analysis produced a 3 factor structure explaining 61% of the variance. For the faecal incontinence items, Rotated Factor 1 accounted for a large proportion of the variance 40.06%, while Rotated Factors 2 and 3 accounted for 10.70% and 10.24% respectively.

Rotated Factor 1 appears to represent the common factor of leakage / soiling. While Rotated Factor 2 could represent other bowel / stomach symptoms and Rotated Factor 3 could represent the number of bowel movements.

Selecting the Best Items

The Wexner flatus item had a low item–total correlation and the internal consistency of this scale would be improved if it was deleted.

The faecal incontinence prevalence estimates were 8% if this item was excluded but rose to 35% if included. Thus it is recommended that this item be excluded in epidemiological research.

The additional item 'does stool leak so that you have to change your underwear?' had slightly better psychometric properties than the pad item in the Wexner which has been the subject of some criticism (Vaizey et al. 1999).

From these considerations the five best items were selected to form the Revised Faecal Incontinence Scale.

IRT analysis confirmed the findings from the Classical Test Theory analyses – also identifying problems with the flatus item and the pad item from the Wexner.

The RFIS

The RFIS has superior measurement properties when compared with the Wexner. The items comprising this scale are:

- Do you leak, have accidents or lose control with solid stool?*
- Do you leak, have accidents or lose control with liquid stool?*
- Do you leak stool if you don't get to the toilet in time?
- Does stool leak so that you have to change your underwear?
- Does bowel or stool leakage cause you to alter your lifestyle?*

* = items included in the Wexner

The response categories for these items are the same as for the Wexner.

Conclusions

1. The Wexner flatus item should be excluded from epidemiological studies as it confounds prevalence estimates. Since flatus is common in the community, and the flatus item is poorly worded, its equal weighting with other faecal leakage items would also present problems for clinical applications.
2. The RFIS has superior psychometric properties to the standard Wexner and includes an item associated with faecal urge incontinence.
3. It is noted that these scales were derived from a statistical modelling exercise and are currently being further assessed in clinical settings.

A copy of the report can be obtained from Jan Sansoni.

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Acknowledgements

Study funded by the Australian Government Department of Health and Ageing as part of the National Continence Management Strategy.

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