

Received Date : 14-Sep-2010

Revised Date : 16-Nov-2010

Accepted Date : 10-Dec-2010

Article type : Original Article

499-2010.R1

Original Article

Validation Study of the Japanese Version of the Faecal Incontinence Quality of Life Scale

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This is an Accepted Article that has been peer-reviewed and approved for publication in the *Colorectal Disease*, but has yet to undergo copy-editing and proof correction. Please cite this article as an “Accepted Article”; doi: 10.1111/j.1463-1318.2011.02558.x

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Abstract

AIM: The aim of the present study was to conduct a psychometric validation of the Japanese version of the FIQL (JFIQL).

METHOD: A retrospective analysis of data from the JFIQL was conducted, Wexner scores, and the Fecal Incontinence Severity Index (FISI) were collected prospectively in patients with faecal incontinence who visited our centre between 2008 and 2009. For convergent validity, the JFIQL scores were compared with stages on the Wexner score for lifestyle alteration. To evaluate reliability, Cronbach's alpha was calculated for internal consistency, whereas a test-retest study was performed to evaluate reproducibility. In assessing responsiveness, JFIQL scores before and after treatments were compared in patients whose FISI scores decreased by $\geq 50\%$.

RESULTS: Convergent validity and internal consistency were determined in 70 patients (49 women; median age 68.5 years). The JFIQL scores were significantly associated with life style alteration stages on the Wexner score, demonstrating convergent validity in all four domains and

the generic score. Cronbach's alpha was >0.7 for generic scores and all domains except Embarrassment. The intraclass correlations for the 27 patients available for the test-retest study were >0.7 for generic scores and all domains except Embarrassment. The median JFIQL score improved significantly after treatment in the 23 patients whose FISI scores decreased $\geq 50\%$, indicating good responsiveness in all four domains and the generic score.

CONCLUSION: The JFIQL has been validated and is now ready for use in evaluating the symptom-specific QOL in Japanese patients with faecal incontinence.

What is new in this paper:

This is the first study validating the Japanese version of the FIQL (JFIQL). The JFIQL was validated not only for convergent validity and reliability, but also for responsiveness, which has never been addressed before. We also validated a generic JFIQL score in addition to scores for four specific domains.

Introduction

Faecal incontinence impairs the quality of life (QOL)[1], causing embarrassment and psychological distress, as well as limiting daily activities. In order to choose an optimal therapy and evaluate the efficacy of treatment, individual symptoms and the QoL must be assessed as accurately and objectively as possible.

In our institution, the Cleveland Clinic Florida Fecal Incontinence score, the so-called Wexner score [2], the Fecal Incontinence Severity Index (FISI)[3], and the Fecal Incontinence Quality of Life Scale (FIQL)[4] are used to evaluate symptom severity and QOL in patients with faecal incontinence.

In 2000, Rockwood et al.[4] published the FIQL, which was specifically designed to evaluate the QOL of patients with faecal incontinence and was validated in English. Since then, the FIQL has been translated and validated in several languages, including French[5], Portuguese[6], Italian[7], Spanish[8], and Turkish[9]. The aim of the present study was to develop a Japanese version of the FIQL (JFIQL) and to assess its psychometric properties in Japanese patients with fecal incontinence.

Method

Patients

Data for the JFIQL were collected prospectively after the questionnaire had been self-administered by consecutive patients presenting to the Pelvic Floor Center, Kochi Medical School Hospital, with a chief complaint of faecal incontinence between September 2008 and August 2009. Patients' symptoms were also evaluated with a structured questionnaire that yielded the Wexner score and FISI. Patients were evaluated using the JFIQL, Wexner, and FISI on another two occasions: one when an anorectal physiology examination was performed and another after some patients had received treatment for their fecal incontinence.

JFIQL

The FIQL comprises 29 questions in four domains, namely Lifestyle (ten items), Coping/Behavior (nine items), Depression/Self-perception (seven items), and Embarrassment (three items). Each domain of the JFIQL was scored according to the original publication [4]. In the present study, the equation used to calculate the score for the Coping/Behavior domain was corrected, adopting Q3-c instead of Q3-d, which seems to have been a typographical error in the original paper[10]. A generic score, which was not used in the original English version, was calculated as an average of all 29 items. This generic score was used as an index of the general faecal incontinence-specific QOL.

The English FIQL was translated into Japanese by one of the authors (TM), who is fluent in both

Japanese and English and has considerable expertise in the area of functional bowel disorders [11]. Some modifications were made to adapt the English version to Japanese culture and linguistics. First, the term “to church” in Q2-d was replaced by “shopping” because going to church is not a customary practice in Japan. Second, the answers in section Q3 were changed from referring to “degree” to “frequency”, which is more natural for Japanese people. This modification also appears in the Spanish version of the FIQL[8]. The JFIQL is provided in the Appendix.

Validation Methods

The psychometric properties of the JFIQL were determined in terms of convergent validity, reliability, and responsiveness, as described below. Analysis was conducted for the four domains and for the generic score.

Validity

To test the convergent validity of the JFIQL, JFIQL scores were compared with the QOL component of the Wexner score that related to lifestyle alterations. Both scores were determined from data collected at the patient’s first visit. Lifestyle alterations on the Wexner score are classified into five stages depending on the frequency of lifestyle changes due to fecal incontinence [2].

Mean JFIQL scores for each of the Wexner lifestyle alteration stages were calculated and compared using one-way ANOVA to identify any trends among the five stages. A positive

association between JFIQL scores and Wexner lifestyle alterations can be taken as evidence of convergent validity.

Reliability

Internal consistency and reproducibility were investigated to evaluate the reliability of the instrument. Internal consistency examines the complementary nature of items by searching for contradictions and measurement errors. To evaluate internal consistency, Cronbach's alpha was calculated for the generic score and all four domains. A high positive value for Cronbach's alpha (i.e. ≥ 0.70) suggests that the JFIQL measures consistently.

To evaluate reproducibility, a test-retest study was performed by comparing JFIQL scores obtained at the time of the patient's first visit with those obtained at the second visit, when anorectal physiology examinations were undertaken without any interventions applied between the two visits. Comparisons were made using intraclass correlation analysis and a high positive correlation coefficient (i.e. ≥ 0.70) can be taken as evidence of reproducibility.

Responsiveness

To assess the sensitivity of the JFIQL in detecting changes in QOL after some treatment, its responsiveness was evaluated. For this purpose, JFIQL scores obtained at the time of the patient's first visit were compared with those obtained in patients whose symptoms of fecal incontinence

improved significantly after some treatment. Significant symptomatic improvement was defined as a reduction in the FISI of $\geq 50\%$.

Statistical analysis

Data were regarded as parametric and are expressed as the mean \pm SD. Statistical analyses were performed using SPSS version 18 (July 2009). One-way ANOVA, Cronbach's alpha, Intraclass correlations, and paired *t*-tests were conducted as appropriate. $P < 0.05$ was considered significant.

Ethics

Because this questionnaire survey was conducted as a part of our clinical practice and was needed to provide the best possible care for the patients, our Institutional Research Board did not require us to obtain ethics approval for the study. However, written informed consent was obtained from all patients who participated in the study at the time of their initial visit so that their clinical data could be used for any clinical study so long as their privacy was not jeopardized.

Results

During the study period, 91 patients presented at our center with the chief complaint of faecal incontinence. Twenty one were excluded owing to lack of data.(Fig 1). The characteristics of these patients are given in Table 1.

Convergent validity

Analysis using one-way ANOVA indicated a significant association between lifestyle changes due to faecal incontinence on the Wexner score and the generic JFIQL score and the scores in all four domains. Specifically, the more frequent the lifestyle alterations on the Wexner score, the lower the JFIQL scores for each of the four domains and the generic score. The p value was less than 0.001 for scores in Lifestyle, Coping/Behavior, and Embarrassment domains, as well as for the generic score, whereas it was 0.04 for the score in the Depression/Self-perception domain.

Reliability

The internal consistency of the JFIQL in the 70 patients, evaluated using Cronbach's alpha, was found to be 0.92 for Lifestyle, 0.87 for Coping/Behavior, 0.83 for Depression/Self-perception, 0.68 for Embarrassment, and 0.95 for the generic score. These results indicate that the JFIQL measures consistently for the generic score and across all domains except Embarrassment.

In the test–retest study, data were available for 27 of 70 patients (39%) at the second visit (Fig. 1). The mean interval between the first and second visits was 29+14 days. Intraclass correlation coefficients for the 27 patients are given in Table 2. There was a good correlation between JFIQL scores obtained on the first and second visits in the generic score and across all domains except Embarrassment.

Responsiveness

Of the 70 patients in the study, 23 achieved significant symptomatic improvement and served as the subjects for the responsiveness study (Fig. 1). In these 23 patients, the mean generic JFIQL score improved significantly after treatment from 2.55 to 3.41 (Table 3). Similar significant improvements were observed in JFIQL scores across all four domains.

Discussion

The present study provides sufficient evidence supporting the reliability and validity of the JFIQL not only in convergent validity and reliability, but also in responsiveness, which has not been addressed by other validation studies of the FIQL. The present study also validated the generic JFIQL score in addition to scores for each of the four domains.

We sought permission from Dr Rockwood, the first author of the original FIQL, to conduct a validation study of the JFIQL, but he stated that permission was not required because the FIQL “is in the public domain and freely available to anyone and everyone for whatever use they choose”.

Regarding convergent validity, there is no gold standard fecal incontinence-specific QOL questionnaire that can be compared with the FIQL. Some papers[6,8,9], including the original FIQL study[4], have compared the FIQL with the SF-36[12] and reported a significant correlation between the two. However, the correlation coefficients reported were rather low, ranging between 0.28 and 0.65, indicating that, in fact, there was not a good correlation between the FIQL and SF-36. This is quite natural because the SF-36 is not a symptom-specific questionnaire for fecal

incontinence.

In the present study, lifestyle alterations on the Wexner score were used as a comparison to determine the convergent validity of the JFIQL because the lifestyle alterations on the Wexner score are an indicator of changes in QOL specific to fecal incontinence. Although only one item on the Wexner score was used, there was a significant association between lifestyle alterations on the Wexner score and JFIQL scores, confirming the convergent validity of the JFIQL for faecal incontinence.

A strong internal consistency was demonstrated for the generic score and across all domains except Embarrassment. Exceptions for the Embarrassment domain have also been reported for versions of the FIQL in other languages[5-9], with the discussion centering on the fact that the Embarrassment domain contains only three items, a much smaller number than in the other three domains. However, the real reason for the exceptions noted for Embarrassment may be that item Q2-l is not a suitable question for inclusion in this domain. Item Q2-l asks about symptoms only, whereas the other two items in this domain specifically ask about feeling embarrassed. In order to confirm our reasoning, we performed “If-item-deleted” analysis. The results of this analysis indicated that Q2-l was not consistent with Q3-a and Q3-e in Embarrassment; specifically, Cronbach’s alpha without Q2-l was 0.73, much higher than the values of 0.57 and 0.41 obtained if Q3-a and Q3-e were omitted, respectively.

Strong reproducibility was demonstrated for the generic score and all four domains except

Embarrassment despite the relatively long interval of 29+14 days between the first and second visits in the present study. Although this long interval is due, in part, to the retrospective nature of our study, it may more likely reflect the actual situation of clinical practice than a shorter interval of 7–10 days, which has been used in prospective studies of the instrument in other languages (Table 4)[5,6,8,9]. The short interval could overestimate the test–retest reliability because, at the time of the second test, patients may be able to recall what they had answered in the first test.

The relatively low intraclass correlation coefficient for the Embarrassment domain obtained in the present study has also been reported by studies of the instrument in other languages (Table 4)[5,8,9]. As discussed above for internal consistency, this may be due to the small number of items in the Embarrassment domain. However, another possibility is that any feelings of embarrassment felt by patients were reduced after the first visit, in which patients were able to discuss their perceived shameful symptoms of faecal incontinence with their doctor for the first time. This discussion may have resulted in an unintentional reduction in their feelings of embarrassment at the time of the second visit.

Good responsiveness was confirmed in the present study, with JFIQL scores having increased significantly in accordance with marked symptomatic improvements. Although Kwon *et al.*[13] emphasized the importance of responsiveness in a QOL questionnaire, this aspect has not been analyzed by the studies performed in other languages[5-9], probably because the duration of those studies was not long enough to include patient treatment.

There are two major limitations of the present study. First, this is a retrospective study, which resulted in many dropouts because of incomplete data and/or the initiation of treatment prior to the retest. Second, a formal linguistic validation was not performed using a translation–back translation method or a linguistic consensus board.

The FIQL is the best symptom-specific questionnaire available at present and deserves to be called the gold standard for the evaluation of the QOL of patients with fecal incontinence because it has been validated in several languages and is used more and more frequently in many high-quality studies. The utilization of the FIQL makes it easy to compare international studies on fecal incontinence and enables us to conduct international multicenter studies in several languages. We hope that the FIQL will be translated and validated in more languages.

Acknowledgment

The authors thank Dr Chizu Mimura for her assistance with the statistical analyses.

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Table 1 Characteristics of the 70 patients with faecal incontinence

Age (years)	68.5±18.9
Gender, M / F, n	21/49
Duration of FI (months)	57.1±99.6
FISI	17.0±1.3
Wexner	8.8±0.6
Generic score of the JFIQL	3.0±0.1

Unless indicated otherwise, data show the mean ± SD.

FI, fecal incontinence; FISI, Fecal Incontinence Severity Index;

Wexner, Cleveland Clinic Florida Fecal Incontinence score;

JFIQL, Japanese version of Fecal Incontinence Quality of Life Scale.

Table 2 Reproducibility (test–retest study)

Domains (no. items)	Score at first visit	Score at second visit	Intraclass correlation coefficient
Lifestyle (10)	3.00±0.84	3.02±0.82	0.76
Coping/Behavior (9)	2.45±0.77	2.68±0.75	0.74
Depression/Self-Perception (7)	2.90±0.70	3.15±0.75	0.72
Embarrassment (3)	2.37±0.71	2.67±0.66	0.59
Generic score (29)	2.74±0.63	2.97±0.64	0.77

Data are the mean ± SD.

Table 3 Responsiveness

	Score before treatment	Score after treatment	<i>P</i> value (paired <i>t</i> -test)
Lifestyle	3.00±0.98	3.83±0.78	<0.001
Coping/Behavior	2.22±0.85	3.22±0.79	<0.001
Depression/Self-perception	2.93±0.79	3.66±0.65	<0.001
Embarrassment	2.22±1.03	3.33±0.55	0.006
Generic score	2.55±0.83	3.41±0.67	<0.001

Data are the mean ± SD.

Table 4 Comparison of published data with regard to intraclass correlation coefficients

	Rullier <i>et al.</i> ⁸ (French)	Minguez <i>et al.</i> ¹¹ (Spanish)	Dedeli <i>et al.</i> ¹² (Turkish)	Present study (Japanese)
Lifestyle	0.93	0.92	0.94	0.76
Coping/Behavior	0.86	0.90	0.90	0.74
Depression/Self-Perception	0.87	0.85	0.88	0.72
Embarrassment	0.80	0.74	0.76	0.59
Generic score	-	-	0.97	0.77
Test–retest interval (days)	7	7–10	7–10	29+14
Patients in the study, n	100	111	50	27

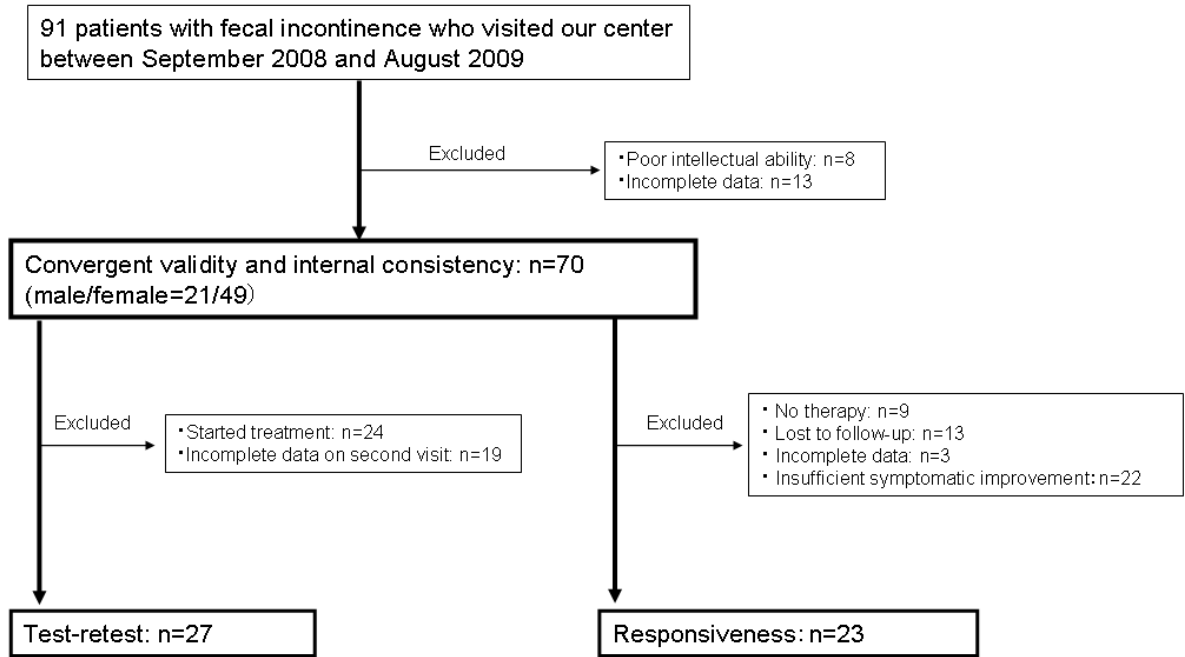


Figure 1. Flow diagram of patients included in the study and those excluded from analysis for various reasons

Appendix (Online-Only)

日本語版 Fecal Incontinence Quality of Life Scale (JFIQL)

Q1: 全体的に考えて、あなたの健康状態はいかがですか。

1. 素晴らしい
2. とても良い
3. 良い
4. あまり良くない
5. 悪い

Q2: 以下の各項目について、便失禁のために当てはまる頻度を 1 ~ 4 から選んでください。

その項目が自分に無関係な質問であったり、たとえ関係してもそれが便失禁とは無関係の場合は

「該当せず」にマルをしてください。

	ほぼ 常に	時々	まれ に	全く ない	該当 せず
Q2. 便失禁のために					
a. 外出したくない	1	2	3	4	<input type="checkbox"/>
b. 友達の家に行くのを避ける	1	2	3	4	<input type="checkbox"/>
c. 外泊を避ける	1	2	3	4	<input type="checkbox"/>
d. 映画や買い物に出かけるのが難しい	1	2	3	4	<input type="checkbox"/>
e. 外出前の食事の量を減らす	1	2	3	4	<input type="checkbox"/>

f.外出中はなるべくトイレの近くに居る	1	2	3	4	<input type="checkbox"/>
g.排便のタイミングに合わせて日頃の計画を立てる	1	2	3	4	<input type="checkbox"/>
h.旅行を避ける	1	2	3	4	<input type="checkbox"/>
i.トイレに間に合わないのが心配	1	2	3	4	<input type="checkbox"/>
j.排便に関してコントロールできない気がする	1	2	3	4	<input type="checkbox"/>
k.排便の時にトイレまで間に合わない	1	2	3	4	<input type="checkbox"/>
l.知らないうちに便が漏れている	1	2	3	4	<input type="checkbox"/>
m.トイレのそばに居ることによって便失禁を防ごうとして いる	1	2	3	4	<input type="checkbox"/>

Q3: 以下の各項目について、便失禁のために当てはまる頻度を 1 ~ 4 から選んでください。

その項目が自分に無関係な質問であったり、たとえ関係してもそれが便失禁とは無関係の場合は

「該当せず」にマルをしてください。

	ほぼ 常に	時々	まれ に	全く ない	該当 せず
Q3. 便失禁のために					
a. 恥ずかしいと感じる	1	2	3	4	<input type="checkbox"/>
b. やりたいと思った事ができない	1	2	3	4	<input type="checkbox"/>
c. 便を漏らすのではないかと心配だ	1	2	3	4	<input type="checkbox"/>
d. 気分が落ち込む	1	2	3	4	<input type="checkbox"/>
e. 他人が、私がウンコ臭いと思うのではないかと心配だ	1	2	3	4	<input type="checkbox"/>
f. 自分が健康ではないと感じる	1	2	3	4	<input type="checkbox"/>
g. 人生が楽しくない	1	2	3	4	<input type="checkbox"/>
h. 自分がしたいと思う回数のセックスができない	1	2	3	4	<input type="checkbox"/>
i. 自分が他人と違う気がする	1	2	3	4	<input type="checkbox"/>
j. 便を漏らすのではないかと不安が常に頭の中にある	1	2	3	4	<input type="checkbox"/>
k. セックスするのが不安だ	1	2	3	4	<input type="checkbox"/>
l. 飛行機や電車で旅行する事を避ける	1	2	3	4	<input type="checkbox"/>
m. 外食を避ける	1	2	3	4	<input type="checkbox"/>
n. 知らないところへ初めて行ったら、必ずトイレの場所を	1	2	3	4	<input type="checkbox"/>

確認する

Q4. 過去 1 ヶ月の間、何もやる気が起きないくらいに、悲しかったり、がっかりしたり、

たくさんの問題を抱えましたか。

1. 全くその通り (全ての事をあきらめる程ひどかった)
2. 非常にその通り
3. とてもその通り
4. ある程度はその通り (気になる程度であった)
5. 少しだけその通り
6. 全くそんなことはなかった (とても快適だった)

各群および総合評価の点数算出方法

Q 1 は 5 段階で、Q 2 と 3 は 4 段階で、Q 4 は 6 段階で評価する。

Q 2、3、4 は、点数が低いほど QOL が低いことを意味するが、Q 1 のみは点数が低いほど QOL が高いことを意味するため、Q 1 のみ集計時に点数を逆転する必要がある。

各群のスコアは平均値で示す。すなわち、各群の項目の全ての点数を合計した後、その群の項目数で割る。

「該当せず」は欠損データとして扱い、平均値の算出対象から除外する。

1 群 . 生活スタイル (Lifestyle) , 10 項目: Q2a, Q2b, Q2c, Q2d, Q2e, Q2g, Q2h, Q3b, Q3l, Q3m

2 群 . 対処/日常行動 (Coping/Behavior) , 9 項目: Q2f, Q2i, Q2j, Q2k, Q2m, Q3c, Q3h, Q3j, Q3n

3 群 . 憂鬱感/自己認識 (Depression/Self Perception) , 7 項目: Q1, Q3d, Q3f, Q3g, Q3i, Q3k, Q4

4 群 . 羞恥心 (Embarrassment) , 3 項目: Q2l, Q3a, Q3e

総合評価 (Generic score) , 全 29 項目

Back translated English Version of the JFIQL

Q1: In general, would you say your health is:

- 1 Excellent
- 2 Very Good
- 3 Good
- 4 Fair
- 5 Poor

Q2: For each of the items, please indicate how much of the time the issue is a concern for you due to accidental bowel leakage. (If it is concern for you for reasons other than accidental bowel leakage then check the box under Not Apply, (N/A).)

Q2. Due to accidental bowel leakage:	Most of the Time	Some of the Time	A Little of the Time	None of the Time	N/A
a. I am afraid to go out	1	2	3	4	<input type="checkbox"/>
b. I avoid visiting friends	1	2	3	4	<input type="checkbox"/>
c. I avoid staying overnight away from home	1	2	3	4	<input type="checkbox"/>
d. It is difficult for me to get out and do things like going to a movie or shopping	1	2	3	4	<input type="checkbox"/>
e. I cut down on how much I eat before I go out	1	2	3	4	<input type="checkbox"/>
f. Whenever I am away from home, I try to stay near a restroom as much as possible	1	2	3	4	<input type="checkbox"/>
g. It is important to plan my schedule (daily activities) around my bowel pattern	1	2	3	4	<input type="checkbox"/>
h. I avoid traveling	1	2	3	4	<input type="checkbox"/>
i. I worry about not being able to get to the toilet in time	1	2	3	4	<input type="checkbox"/>
j. I feel I have no control over my bowels	1	2	3	4	<input type="checkbox"/>
k. I can't hold my bowel movement long enough to get to the bathroom	1	2	3	4	<input type="checkbox"/>
l. I leak stool without even knowing it	1	2	3	4	<input type="checkbox"/>
m. I try to prevent bowel accidents by staying very near a bathroom	1	2	3	4	<input type="checkbox"/>

Q3: Due to accidental bowel leakage, indicate how much of the time the issue is a concern for you for each of the following items. (If it is a concern for you for reasons other than accidental bowel leakage then check the box under Not Apply, (N/A).)

Q3. Due to accidental bowel leakage:	Most of the Time	Some of the Time	A Little of the Time	None of the Time	N/A
a. I feel ashamed	1	2	3	4	<input type="checkbox"/>
b. I can not do many of things I want to do	1	2	3	4	<input type="checkbox"/>
c. I worry about bowel accidents	1	2	3	4	<input type="checkbox"/>
d. I feel depressed	1	2	3	4	<input type="checkbox"/>
e. I worry about others smelling stool on me	1	2	3	4	<input type="checkbox"/>
f. I feel like I am not a healthy person	1	2	3	4	<input type="checkbox"/>
g. I enjoy life less	1	2	3	4	<input type="checkbox"/>
h. I have sex less often than I would like to	1	2	3	4	<input type="checkbox"/>
i. I feel different from other people	1	2	3	4	<input type="checkbox"/>
j. The possibility of bowel accidents is always on my mind	1	2	3	4	<input type="checkbox"/>
k. I am afraid to have sex	1	2	3	4	<input type="checkbox"/>
l. I avoid traveling by plane or train	1	2	3	4	<input type="checkbox"/>
m. I avoid going out to eat	1	2	3	4	<input type="checkbox"/>
n. Whenever I go someplace new, I specifically locate where the bathrooms are	1	2	3	4	<input type="checkbox"/>

Q4. During the past month, have you felt so sad, discouraged, hopeless, or had so many problems that you wondered if anything was worthwhile?

- 1 Extremely So – To the point that I have just about given up
- 2 Very Much So
- 3 Quite a Bit
- 4 Some – Enough to bother me
- 5 A Little Bit
- 6 Not At All – Very comfortable

Scale Scoring

Scales range from 1 to 5 in Q1, from 1 to 4 in Q2 & Q3, and from 1 to 6 in Q4, with a 1 indicating a lower functional status of quality of life except Q1. Therefore, Q 1 is to be reverse coded.

Domain scores are the average (mean) response to all items in the domain (e.g., add the responses to all questions in a domain together and then divide by the number of items in the domain. Not Apply is coded as a missing value in the analysis for all questions.)

Domain 1. Lifestyle, ten items: Q2a, Q2b, Q2c, Q2d, Q2e, Q2g, Q2h, Q3b, Q3l, Q3m

Domain 2. Coping/Behavior, nine items: Q2f, Q2i, Q2j, Q2k, Q2m, Q3c, Q3h, Q3j, Q3n

Domain 3. Depression/Self Perception, seven items: Q1, Q3d, Q3f, Q3g, Q3i, Q3k, Q4

Domain 4. Embarrassment, three items: Q2l, Q3a, Q3e

Generic score, all the twenty-nine items
