



Standard questions for a bowel diary to assess fecal incontinence in adults: A consensus project of the International Continence Society

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ABSTRACT

Aims: To develop a minimum set of standard questions to include on a bowel diary for assessing fecal incontinence in adults.

Methods: An interdisciplinary team of ICS members searched and reviewed the literature, analyzed 32 bowel diaries from 9 countries, obtained input from 56 delegates from 19 countries at two ICS workshops, and reached consensus using a modified Delphi method.

Results: Fourteen questions to include as standard on a bowel diary for reporting characteristics of fecal incontinence prospectively in adults were developed.

Conclusion: There are numerous advantages to having standard questions for a bowel diary including potential to improve information about the characteristics and epidemiology of fecal incontinence and enabling comparisons of outcomes of interventions across settings and studies.

1. Introduction

Completion of a bowel diary is an integral component of the clinical assessment of fecal and anal incontinence [1]. Along with a health history and physical examination findings, information from a bowel diary provides useful information to a clinician or researcher for assessing the severity and pattern of fecal or anal incontinence, developing a management plan, and evaluating the effectiveness of interventions that are part of that plan [1,2]. For example, bowel diary information can be compared before and after using an intervention such as dietary fiber supplementation to assess its effectiveness in reducing fecal incontinence.

Most instruments scoring anal incontinence severity are completed one time by the patient using recall, however, a bowel diary is completed on a daily basis and has been shown to be a robust, informative source of data. Fisher et al. [3] reported that a total score of fecal incontinence severity from a 14 consecutive day stool diary of 96

community-living adults was significantly higher (worse) than their score from a bowel history questionnaire using recall. Jones et al. [4] showed that the concordance between prospective reports of gastrointestinal symptoms by patients in the general population or a primary healthcare center on a diary for 7 or 14 consecutive days and responses on a symptom questionnaire using recall was poor. The symptoms reported were (1) occurrence of abdominal pain, (2) abdominal pain relieved by defecation, and (3) change in stool frequency with abdominal pain. Concordance between the two data collection methods was higher for the simplest symptom (i.e., occurrence of abdominal pain) and in the primary care patients vs. the general population sample. Results of these studies suggest that recall can be unreliable and lead to underreporting of fecal incontinence and its severity.

However, there is no standard set of questions assessing fecal and anal incontinence that are recommended to be included in a bowel diary. Insufficient or irrelevant information collected in a bowel diary

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can limit clinical decision-making, and lack of a minimal universal set of data hinders comparison of findings of interventions among studies. On the other hand, asking patients to report unnecessary information will increase their response burden and often reduces adherence.

The aim of this project was to develop a minimum set of standard questions to include on a bowel diary for assessing fecal incontinence in adults.

2. Materials and methods

Methods for this project involved searching and reviewing the literature, examining bowel diaries in current use, seeking input from an international, multidisciplinary group of interested stakeholders, and reaching consensus of a team of continence experts in the International Continence Society.

In order to identify questions that have been included in a bowel diary assessing fecal incontinence in adults, a search of the literature for published articles containing a bowel diary was conducted. OVID Medline and CINAHL were searched in 2018 and again in 2019 using the terms “Bowel Diary” or “Stool Diary” with limits for “all adults” and “English language”. In 2018 and 2019, 67 and 74 articles were identified from Ovid Medline, respectively, and 40 and 42 articles were identified from CINAHL, respectively. Titles and abstracts were reviewed then the full text of potentially relevant articles was read. The searches did not yield any bowel diaries. Articles in files of the project team were also manually searched without yielding any examples of a bowel diary.

Because of the lack of bowel diary questions obtained from the literature and to prepare for an interactive workshop about bowel function at an upcoming ICS annual meeting during which input about standard bowel diary questions was to be obtained from international, multidisciplinary stakeholders, project members asked colleagues to provide examples of a bowel diary assessing fecal incontinence in adults that they used in practice or research. Prior to the second workshop in 2019, staff of the International Continence Society (ICS) emailed individuals registered for the workshop to provide examples of a bowel diary that they used in practice or research. Another request was emailed to all members of ICS. The questions on those bowel diaries were tabulated, and the frequency and percentage of bowel diaries including each question were calculated.

Input of participants at the ICS workshops was sought to inform a project team that would select the final bowel diary questions by consensus. ICS workshop participants were divided into three small groups of approximately 10 people each who rotated among three different stations. All three groups participated in the breakout session about standard bowel diary questions. Workshop participants were provided with a typed list of the questions that appeared on the collected bowel diaries organized into categories, the number and percentage of bowel diaries that included the questions, and examples of the wording of those questions from the diaries. Table 1 illustrates an example of the document that was presented to workshop participants. Participants in the breakout session were asked to mark which questions they believed should be standard on a bowel diary for assessing fecal incontinence for adults. The votes from the two workshops were then totaled together and reviewed by the ICS project team.

During the breakout group discussion, participants were asked to identify any additional questions not on the list that they wanted added, the optimal number of questions and days for completing a bowel diary, and suggestions for the format of the diary. Notes of the discussions were written on a flip chart by the facilitator and reviewed by the participants. The notes from the workshops were typed, summarized by question, and reviewed by the project team.

The workshop facilitators included two nurses and two physiotherapists who were ICS members and expanded to a project team comprised of a total of four nurses, four physiotherapists, and two colorectal surgeons. Project team members were emailed the same information

Table 1

Topics of questions on international bowel diaries.

Incontinence of feces
Frequency of bowel movements
Day/date of every bowel movement
Number of bowel movements
Number of visits to toilet
Time of leakage
Time of bowel movement
Minutes spent in lavatory per bowel movement
Feces consistency/form/type
Diary has stool form/consistency classification images
Incontinence of solid stool
Incontinence of liquid stool
Feces seepage/staining/soiling
Amount/quantity of soiling or leakage (Small, Medium, Large)
Medications and other assistance
Medications (for fecal incontinence)
Other bowel movement assistance (e.g., use fingers)
Incontinence of gas/bloating
Straining/difficulty with bowel movement
Urgency and other associated symptoms
Urgency
Onset of leakage (without realizing it, with activity, etc.)
Pain
Pain location and duration
Abdominal pain/stomachache
Use of pads or other containment devices
Excessive wiping
Incomplete evacuation or blockage
Incomplete or complete evacuation
Blockage or sense of something coming down
Blood
Mucus
Diet, food & drink, meal
Nighttime bowel movements (sleep/awake schedule)
Exercise type
Emotional response
Alteration in lifestyle frequency (Never, Rarely, Sometimes, Weekly, Daily)
Menstrual cycle phase
Date of birth or age

about bowel diary questions provided at the two ICS workshops, results of the voting from all workshop participants, and discussion notes. Project team members were also asked to identify any other questions to be standard on a bowel diary that they thought should be added to the list.

Using a modified Delphi method, project team members independently voted on which questions they thought should be included as standard on a bowel diary for assessing fecal incontinence in adults. Votes were emailed to a research assistant who deidentified their responses, so they were anonymous when tallied and shown to the project team. Questions with at least 75% agreement of the Project team were included as a standard question on a bowel diary. After initial review of the questions, consensus was reached after two rounds of voting. The project team then held a virtual meeting by Zoom to confirm consensus of the findings and the wording and format of the questions.

3. Results

3.1. Example diaries

For the first ICS workshop, 13 diaries from five countries were received. For the second workshop, an additional 19 diaries were received for a total of 32 diaries from nine countries (Australia, Canada, France, Ireland, Japan, Netherlands, United Arab Emirates, United Kingdom, and United States). There were 39 different questions on the collected bowel diaries. Some diaries included questions about diet intake and exercise, likely for efficiency in reducing the number of forms provided to a patient to complete. Table 1 shows the topics of the questions of the bowel diaries and Fig. 1 shows the number of diaries that included the questions in descending order of frequency.

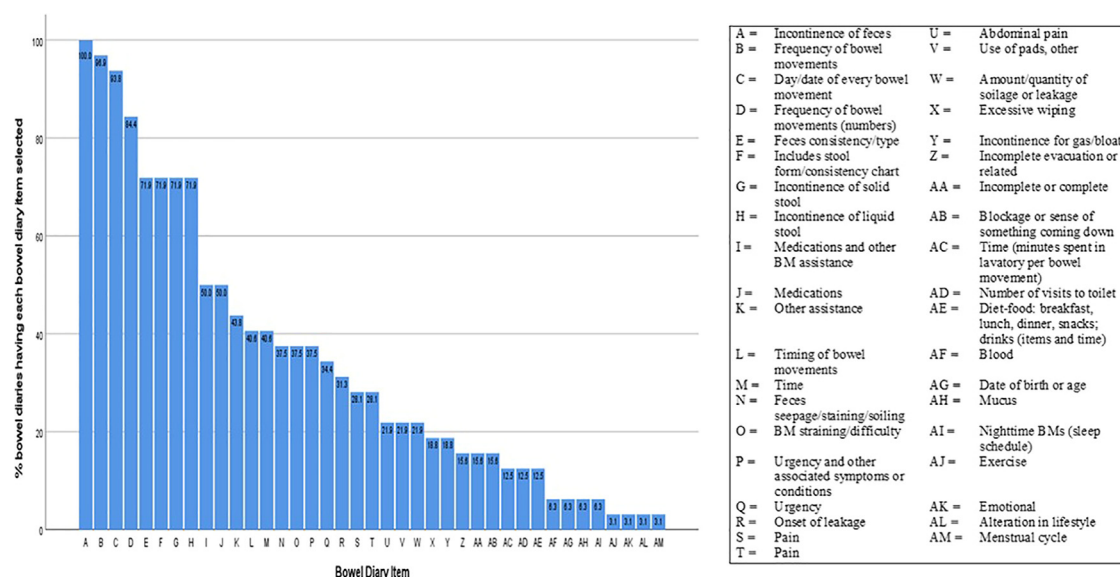


Fig. 1. Percentage of bowel diaries (n=32) containing each question (n=39) in descending order.

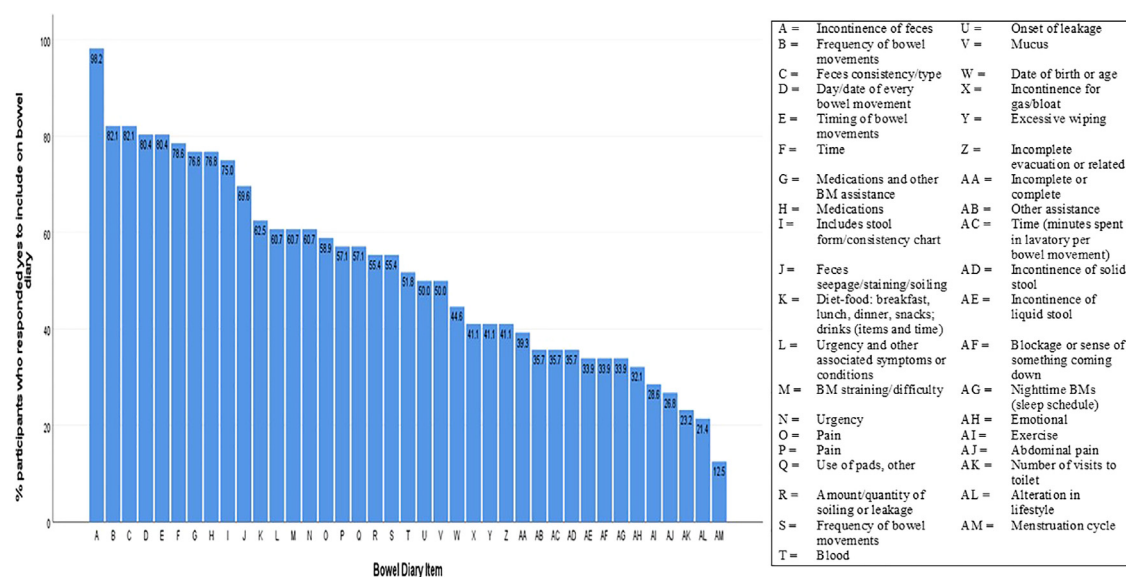


Fig. 2. Percentage of ICS workshop participants (n=56) who voted to include each question (n=39) as standard on a bowel diary for assessing fecal incontinence in adults in descending order.

3.2. Characteristics of ICS workshop participants

A total of 56 delegates participated in the ICS workshop sessions and provided input about standard questions for a bowel diary. Of those, 19 (34%) were nurses, 14 (25%) were physiotherapists, 15 (27%) were physicians, 2 (4%) were Other, and 6 (11%) did not answer the question. Participants were from 19 countries and the majority (79%, n= 44) were female. Most of the participants were experienced in managing fecal incontinence. The years of experience managing fecal incontinence of workshop participants was 0–5 years in 32.1%, 6–10 years in 19.6%, 11–15 years in 10.7%, 16–20 years in 12.5%, 21–25 years in 7.1%, and 26–30+ years in 5.4%; 12.5% did not answer. The work setting of workshop participants was clinical in 70% (n=39),

academic in 14% (n=8), and other in 5% (n=3); 11% (n=6) did not answer.

3.3. Workshop input

The percentage of votes about which question to include as standard on a bowel diary by workshop participants is shown in Fig. 2. The questions receiving the highest percentage of votes related to characteristics of fecal incontinence such as its frequency and consistency/form while questions about other items such as exercise, emotional response, and menstruation had the lowest votes. No additional questions to include on a bowel diary were identified by workshop participants. The discussion among ICS workshop participants included caution about including too many questions on a bowel diary, and approximately

Table 2
Recommended questions to include as standard on a bowel diary to assess fecal incontinence in adults.

Name _____	
Instructions: Answer each question below for each stool and fecal leakage occurrence	
Check 1 ☐ Stool without fecal leakage ☐ Stool and fecal leakage ☐ Fecal leakage without a stool	
Day of the week and Date of stool and/or fecal leakage ☐ Monday* Date _____	
Time of stool and/or fecal leakage _____	
Consistency or form of leakage** ☐ Hard ☐ Formed but not hard ☐ Soft ☐ Loose or unformed ☐ Liquid	Consistency or form of stool** ☐ Hard ☐ Formed but not hard ☐ Soft ☐ Loose or unformed ☐ Liquid
Amount of fecal leakage** ☐ Small (includes seepage and soiling) ☐ Medium ☐ Large or greater	Amount of stool** ☐ Small (includes seepage and soiling) ☐ Medium ☐ Large or greater
Did you have accidental leakage of rectal gas or flatus? ☐ Yes ☐ No	
Did you feel a great sense of urgency to reach the toilet? ☐ Yes ☐ No	
Did you have a feeling of incomplete bowel emptying or blockage? ☐ Yes ☐ No	
Were you aware of the fecal leakage as it occurred? ☐ Yes ☐ No	
Did you take any medications to prevent or lessen fecal leakage? ☐ Yes ☐ No	
Did you wear an absorbent pad or other product to contain fecal leakage? ☐ Yes ☐ No	
Comments (For example: What you were doing when you had fecal leakage if known? Other symptoms?)	

* Add a column for each day of the week.

** If a graphic chart of stool consistency/form or amount is used as an option, answer choices will need to be adjusted to match the graphic charts.

10 questions were suggested as optimal. The optimal number of days for completing a bowel diary was identified as at least 7 consecutive days. When 7 days would not be possible, the minimum number of days for completing a bowel diary was suggested to be 4 consecutive days including weekend days. Although a few workshop participants desired a diary to be completed for 2 to 4 consecutive weeks, most commented that this length of time would not be feasible for most patients, resulting in incomplete or inaccurate data. Regarding the general format of the diary, suggestions were to use simple wording for the questions, keep the length of printed questions to one page and no more than one double-sided printed page, use a font point size that is not too small, and limit the need to write in responses by adopting check boxes whenever possible. It was suggested that the diary questions be in a format that could easily be transferred to an electronic format or mobile application.

3.4. Recommended bowel diary questions

The project team did not suggest any additional questions than those presented on the collected diaries. After reviewing the votes and notes of the workshop participants, the project team reached consensus on the final set of questions to include as standard on a bowel diary shown in Table 2. There are a total of 13 questions about the following: Occurrence of a stool, occurrence of fecal leakage with or without a stool, the day and date of the stool and/or fecal leakage, the time of the stool and/or fecal leakage, the consistency or form of the stool and/or fecal leakage, estimated amount of stool and/or fecal leakage, flatus, urgency, feeling of incomplete bowel emptying or blockage, awareness of leakage, medications taken to prevent fecal leakage, wearing of an absorbent product, and a space for comments and reporting other symptoms. Most questions have answer choices in a checklist format. If the standard questions are developed into a mobile phone or web-based

format, those electronic applications could be designed to automatically provide the day and date and time of the entries for occurrence of a stool and fecal leakage and reduce data entry by the patient user. Because there are no standard, valid, and reliable measurements to define urgency or flatus, a simple dichotomous form of these questions (yes/no present or not) was used. The project team acknowledged that including graphic illustrations of the consistency/form and amount of fecal leakage and continent stool may be a desired option for some as they may assist in promoting reliability of responses to these questions.

4. Discussion

The outcome of the work of this multidisciplinary international team is a recommended minimum set of questions to include as standard on a bowel diary to assess fecal incontinence in adults. These questions are intended to be completed by patients prospectively on a daily basis, optimally after each continent stool or episode of fecal leakage as part of a bowel diary. Completion of a bowel diary for a minimum of seven consecutive days is recommended. The questions are suitable for clinical as well as research purposes. Having standard questions on a bowel diary has several advantages including more consistent information about the characteristics of fecal incontinence and improved information about its epidemiology. They will generate common outcome data allowing comparisons of outcomes of interventions among patients/study participants and across settings and studies and enabling meta-analyses of published findings leading to higher quality, robust knowledge about fecal incontinence. A common set of bowel diary questions offers potential for extensive testing of their usefulness and better reliability. The authors encourage obtaining feedback from patients with fecal incontinence in a variety of countries regarding their ability to understand and use the Bowel Diary and to guide its revision as needed. The project group acknowledges that a new clinical treatment or experimental research intervention may warrant other specific questions and recommends that those questions be used in addition to the proposed standard questions.

Including graphic illustrations of the consistency/form and amount of fecal leakage as well as continent stools as part of a bowel diary to assist patients in reporting these characteristics may improve reliability of responses. There are two sets of graphic illustrations for stool consistency/form that possess good validity and reliability: the Bristol Stool Form Scale with 7 categories of stool form types [5,6] and the shorter Stool Consistency Classification system for Fecal Incontinence by Bliss et al. with 4 categories [7–9]. Both have been used in studies of fecal incontinence [10–12]. The minimal number of categories needed to describe consistency or form of fecal leakage or continent stools has not been determined. A shorter version of the Bristol Stool Form Scale has been developed and tested for use by children [13], and shorter scales may be better suited and adequate for some groups of adults such as the elderly or their caregivers. However, clinical interpretation of categories of stool consistency or form identified by using illustrated tools needs further investigation. For example, Chumpitazi et al. [14] reported that inter- and intra-rater reliability of the Bristol Stool Form Scale by clinicians significantly decreased when the scale was used to categorize the stool types into clinically meaningful categories of constipation, normal, or diarrhea per the Rome III criteria compared to when it is used to assess individual stool types. Differentiation was difficult between type 2 versus type 3 forms and 5 versus type 6 forms, which are at the cutpoints of Rome III criteria for constipation, normal elimination, or diarrhea, respectively. Another consideration is that there may be licensing fees to pay to use some graphic illustrations, such as the Bristol Stool Form Scale [15].

Graphic aides to estimate the amount of fecal leakage or continent stool are less developed than consistency/form. Members of this project group thought that including a reference of measurement in illustrating amount of fecal leakage or continent stool would be important. For example, using a ruler might be suitable for formed or hard stool.

The reference measurement for liquid or soft stool seemed more challenging; some of our group did not favor illustrating containers used in food preparation such as a teaspoon or measuring cup. Further development, testing, and consensus on graphic illustrations of these characteristics of fecal leakage and continent stool are needed as using different illustrations with different categories will result in varying responses by users and conclusions.

As this project was completing, an article was published by Zyczynski et al. [16] reporting the development, external validity, and reproducibility of a bowel diary for a mobile phone that was used in a research study. Questions on this diary included some of the questions recommended as standard on a bowel diary by this group. Their questions were about the type of event (bowel movement, [BM] without leakage, BM with leakage, or leakage, only), the time and date of the event, stool form (with inclusion of the Bristol Stool Form Scale), and presence of urgency. It was unclear whether the question about stool form was to describe the BM without leakage or bowel leakage or both.

A valid and reliable score of the severity of fecal (or anal) incontinence using data obtained from a prospective bowel diary, as proposed by this project, is lacking. Having a single severity score would facilitate interpretation of an individual's fecal incontinence status. The standard questions and answer options proposed for a bowel diary by this consensus project offer opportunity to create a scoring system of fecal incontinence severity based on prospective diary entries.

There are limitations to this project. Although data were obtained from multinational and multidisciplinary individuals, they were primarily members of the ICS or clinical or research professionals with some experience assessing fecal incontinence limiting generalizability of the findings to other types of individuals, such as primary care clinicians. The recommended questions need to be trialed with different groups of adults with fecal incontinence, clinicians, and researchers.

5. Conclusion

The main aim of this project was to address the lack of standard questions to use on a bowel diary to assess fecal incontinence in adults. Members of the ICS with expertise in fecal incontinence accomplished this aim by examining the current literature, analyzing numerous examples of bowel diaries from clinical practice and research from countries around the world, obtaining input from multidisciplinary, international colleagues, and reaching consensus. The new contribution of this work is a much-needed minimum set of standard bowel diary questions that can be used prospectively in the assessment of fecal incontinence of adults by clinicians in practice and clinical researchers. As far as the authors are aware, this is the first set of such questions of their kind. The authors recommend evaluation of the performance and feasibility of using the Bowel Diary in practice and research including patient feedback and of its psychometric properties including inter-rater and test-retest reliability and sensitivity. Future developments include creation of a fecal incontinence severity score based on responses to the questions and further testing or development of standard graphic illustrations to possibly accompany some of the questions.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Authors were members of ICS. D.Z. Bliss and P. Igualada-Martinez are on the editorial board of *Continence*.

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