Validation of the Chinese DeFeC questionnaire: a comprehensive screening tool for symptoms and causes of constipation and incontinence

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Background: Currently, the diagnosis of defecation disorders in China is usually based on varied and ambiguous criteria. We aimed to translate the Groningen Defecation and Fecal Continence (DeFeC) questionnaire to Chinese and test its reproducibility and feasibility in the general Chinese population.

Methods: The Groningen Defecation Questionnaire was translated into Chinese according to the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN). The feasibility and reproducibility were evaluated by performing a test-retest online survey and calculating the Cohen's kappa (κ) coefficient [or intraclass correlation coefficient (ICC)], with 0.01–0.20 considered slight agreement; 0.21–0.40, fair agreement; 0.41–0.60, moderate agreement; 0.61–0.80, substantial agreement; and 0.81–1.00, almost perfect agreement.

Results: In total, 130 respondents completed the questionnaire twice, with a mean age of 47.08±12.46 years. No remarks were made that indicted that the questions were difficult to understand. The median time to complete the questionnaire was 20.78 min [interquartile range (IQR), 14.83–29.20 min] for the first time. The κ coefficient of all defecation function-related domains ranged between 0.25 and 0.71, with an average value of 0.53. The constipation and fecal incontinence-related domains showed a substantial and moderate agreement level, as indicated by κ of 0.65 and 0.52, respectively. The Agachan constipation score and Wexner incontinence score showed perfect and substantial agreement, as indicated by an ICC of 0.88 and 0.74, respectively.

Conclusions: The Chinese version of the Groningen DeFeC questionnaire is highly feasible and reproducible and can be applied in clinical and research activities for the Chinese population.

Keywords: Constipation; epidemiology; fecal incontinence; questionnaires and surveys; risk factor

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Introduction

Defecation disorders, including constipation and fecal incontinence, are common in the general population. They hamper the quality of life and financially burden society (1). Therefore, the recognition of these problems and their underlying causes is important.

Currently, the diagnosis of defecation disorders in China is usually based on varied and ambiguous criteria, probably due to the diverse symptoms of defecation disorders. Medical specialists frequently diagnose fecal incontinence and constipation based on a patient's self-report instead of a systemic collection of the symptoms. These reports include complaints of accidental loss of stool or problems with defecation without reference to other symptoms, such as the frequency and duration of loss of stool occurrence, as proposed in the Rome IV criteria (2). To confirm constipation, doctors frequently ask about the frequency of defecation and stool consistency. However, it has already been shown that these two symptoms can be absent in patients (3) who, according to the Rome IV criteria, are constipated (4). However, most scoring systems examine either fecal incontinence only or constipation, even though the two conditions can co-occur (3) and that constipation can lead to fecal incontinence. This indicates that using one kind of scoring system, that is, regarding only incontinence or only constipation, may be insufficient to diagnose bowel dysfunction optimally. Moreover, the current method of diagnosis does not evaluate the severity of fecal incontinence and constipation, despite the existence of different scoring systems for both conditions (5-11). Many of these scores

have been translated into Chinese and validated (12-15), but they are not widely used in the clinical environment.

Diagnosis of the disease or symptoms and the diagnosis of all underlying causes are crucial to treating fecal incontinence or constipation efficiently. Diagnostic tests, such as anorectal manometry, are the best option for diagnosing such underlying causes. However, multiple symptoms reported by patients can indicate the cause, and adequate diagnostic tests can be chosen based on such indications.

Currently, there are no guidelines available in Chinese that would allow doctors to simultaneously diagnose coexistent constipation and fecal incontinence and perform comprehensive screening of such symptoms, which could indicate the underlying cause of either constipation or fecal incontinence.

The Groningen Defecation and Fecal Continence (DeFeC) questionnaire was developed to comprehensively evaluate such symptoms, including the possible causal risk factors for both fecal incontinence and constipation (16). It has been proven to bear good reproducibility and reliability (16), validated in the Dutch population, and applied in epidemiological studies (3,16-20). However, its Chinese version has yet to be made available.

Therefore, we aimed to translate and assess the reproducibility and feasibility of the DeFeC questionnaire to provide medical specialists with a comprehensive screening tool for the diagnosis of constipation and fecal incontinence in China. This tool will also enable the systematic collection of data for research on defecation problems in the Chinese population. We present the following article in accordance with the SURGE reporting checklist (available at https://apm.amegroups.com/article/view/10.21037/apm-22-1009/rc).

Highlight box

Key findings
• The Chinese version of the Groningen Defecation and Fecal Continence questionnaire is highly feasible and reproducible.

What is known and what is new?
• Currently, the diagnosis of defecation disorders in China is usually based on varied and ambiguous criteria.
• In this study, we describe the process of translation and assessment of the reproducibility and feasibility of the DeFeC questionnaire to provide medical specialists with a comprehensive screening tool for the diagnosis of constipation and fecal incontinence in China.

What is the implication, and what should change now?
• The Chinese version of the Groningen Defecation and Fecal Continence questionnaire can be applied in clinical and research activities for the Chinese population.

Methods

The DeFeC questionnaire consists of nine domains containing questions related to factors and symptoms contributing to bowel dysfunction. The domains comprise the following issues: demographic characteristics, defecation pattern, constipation complaints, constipation-related therapies, fecal continence, anorectal sensation, and voluntary contractions, urinary continence, obstetric and gynecological history, and pelvic floor-related medical history (16). The reproducibility and feasibility of the translated Chinese version of the DeFeC questionnaire were investigated in this study. For the English version of the DeFeC questionnaire, please refer to previous

study by Meinds and his colleagues (16). This study was approved by the Medical Ethical Committee of University Medical Center Groningen (No. M22.298227) and performed following the ethical standards laid down in the Declaration of Helsinki (as revised in 2013). We did not obtain informed consent from the respondents because the Dynata company (Rotterdam, the Netherlands) has provided us with an anonymous database.

Translation process

Four sworn translators translated the DeFeC questionnaire into Chinese according to internationally acknowledged COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) principles (21). One translator translated the questionnaire from Dutch to English, another from English to Chinese, and finally back to English and Dutch. Discrepancies among the translations were discussed and adapted in the final Chinese DeFeC questionnaire version. The Delphi technique was used to obtain consensus opinions on the content and translation process (22). Due to the different eating habits in the Chinese population, one question about eating bread was replaced with one about eating cereals, and one item was added regarding spicy food intake. Questions related to education and geographic residence were also adjusted accordingly. To obtain feedback on the translation, we examined the understanding of the questionnaire in a Chinese consortium consisting of sworn translators, colorectal surgeons, nurses, and representatives of the general Chinese population. The final version of Chinese DeFeC was obtained based on the feedback provided by the consortium, and was available at the online platform of Department of Colorectal Surgery, Changhai Hospital.

Reproducibility and reliability

A test-retest survey was performed to determine the reproducibility of all question items and the reliability of the different scoring systems within the DeFeC. Participants from all regions of mainland China were recruited using an external survey company (Dynata). During the first round of the survey, respondents were invited to participate in a survey. They logged in via a link provided in the e-mail to their accounts and filled in a questionnaire, in this case, the DeFeC questionnaire. An algorithm randomly selected the questionnaire the respondent was given to fill in. Different types of rewards were given to respondents for

filling in the questionnaires, depending on the panel from which the respondents came. Respondents were sent an e-mail invitation to complete the DeFeC one more time after approximately six months until a sample of at least 100 respondents was achieved. A sample size of 100 was chosen for the re-test based on our previous study in which the DeFeC questionnaire was validated for the Dutch population (16). This time interval was used to ensure that the test-retest interval was long enough to prevent recall. The time taken to complete the questionnaire was also assessed. Respondents with contradictory answers to questions regarding giving birth to a child or uterine removal, in the case of female respondents, were excluded. Respondents with illogical answers were also excluded.

The diagnostic validity in terms of functional constipation and fecal incontinence has been previously proven (16). In addition, the DeFeC questionnaire contains questions consistent with the Rome IV criteria for constipation and fecal incontinence (23), as well as the Agachan constipation (5) and Wexner incontinence scores (6). These criteria and scores have already been validated and are widely used in their Chinese versions.

Statistical analysis

All statistical analyses were performed using IBM SPSS Statistics, version 23.0 (Armonk, NY, USA). Descriptive statistics on personal characteristics and time to complete the questionnaire are shown as mean ± standard deviation or median and interquartile range (IQR), depending on their distribution. Categorical variables are presented as numbers (percentages). The percentage of observed agreement was calculated for all the categorical and dichotomous questions. The reproducibility of all questions was evaluated by calculating the unweighted Cohen's kappa coefficient (κ) for questions with dichotomous answer options and the weighted Cohen's kappa coefficient for questions with multiple, ordinal answer options. The reliability of the continuous scoring system was expressed as the intraclass correlation coefficient (ICC). The κ coefficient did not apply to the open-ended questions. All κ coefficients and ICC values were interpreted according to Landis and Koch (24); values between 0.01 and 0.20 were considered to indicate slight agreement, values between 0.21 and 0.40 to indicate fair agreement, values between 0.41 and 0.60 to indicate moderate agreement, values between 0.61 and 0.80 to indicate substantial agreement, and values between 0.81

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Table 1 Participants' demographical and clinical characteristic (N=130)

Variable	Values
Sex, n (%)	
Male	94 (72.3)
Female	36 (27.7)
Age (years), mean ± SD	47.08±12.46
Education level, n (%)	
University or higher	62 (47.7)
Lower than university	68 (52.3)
Living area, n (%)	
Urban	112 (86.2)
Rural	18 (13.8)
Time interval between the first test and re-tests (months), mean ± SD	6.89±1.22
Time to finish the questionnaire	
The first time (minutes)	20.78 (IQR 14.83–29.20)
The second time (minutes)	24.54 (IQR 13.61–62.56)

SD, standard deviation.

Table 2 Reproducibility of the 8 main domains of DeFeC questionnaire

Questionnaire domains	κ value[†]	Interpretation[‡]
Defecation pattern	0.44	Moderate
Constipation complaints	0.71	Substantial
Constipation-related therapies	0.45	Moderate
Fecal continence	0.61	Substantial
Anorectal sensation and voluntary contractions	0.48	Moderate
Urinary continence	0.67	Substantial
Obstetric and gynecologic history	0.60	Moderate
Pelvic floor related medical history	0.25	Fair
Average value	0.53	Moderate

[†], Cohen's kappa (κ) coefficient; [‡], interpretation of κ coefficients according to Landis and Koch (24). DeFeC, Defecation and Fecal Continence.

and 1.00 to indicate almost perfect agreement (24).

Results

In total, 1,555 respondents completed DeFeC online during the primary survey. For the re-test procedure, 517 respondents were randomly selected from the total sample and invited one more time to answer the questionnaire. A total of 36.8% (190/517) of respondents answered the questionnaire for the second time. After excluding contradictory and illogical answers (n=60), data from 130 respondents between 19 and 72 years of age were available for analysis. The mean time interval between the test and retest was 6.89±1.22 months.

Feasibility

None of the respondents commented on the ambiguity of any of the questions in the translated DeFeC questionnaire, including the adjusted Chinese version of questions about demographic factors and eating habits. The overall median time to complete the DeFeC was 20.78 min (IQR, 14.83–29.20 min) and 24.54 min (IQR, 13.61–62.56 min) for the first and second times, respectively (*Table 1*). None of the patients reported that the questionnaire was too lengthy.

Reproducibility of all question items in the Chinese version of the DeFeC questionnaire

The answers provided to the questions included in the demographic domain, namely questions regarding age, sex, residence province, and education level, were in perfect agreement (100% agreement). Analysis based on the κ coefficients of the categorical variables and the ICCs of the continuous variables indicated that the majority of the other eight domains showed moderate or higher than moderate agreement. Only the pelvic floor-related medical history domain showed fair agreement (*Table 2*). The κ coefficients and the ICCs of the eight functional domains ranged between 0.25 and 0.71, with a mean value of 0.53 (*Table 2*). We also calculated the consistency of every item in the DeFeC questionnaire (*Table 3*), and we found that the

Table 3 The Cohen's kappa value in different domains in the DeFeC questionnaire

Item[†]	κ[‡]	95% CI
Defecation patterns		
1.1 (How often do you empty bowels?)	0.53	0.34 to 0.67
1.2 (Stool consistency)	0.34	0.07 to 0.53
Mean	0.44	
Constipation complaints		
2.1 (Difficulties in emptying bowels)	0.67	0.53 to 0.81
2.2 (Frequency to strain hard to empty bowels)	0.85	0.78 to 0.89
2.3 (Length of strain while emptying bowels)	0.61	0.46 to 0.73
2.4 (Frequency of defecation blockage)	0.84	0.78 to 0.89
2.5 (Frequency of feeling not completely emptied bowels after passing stools)	0.87	0.82 to 0.91
2.6 (Frequency of not managing to pass stools after urge feeling)	0.75	0.65 to 0.83
2.7 (Frequency of return to the toilet within one hour of emptying bowels)	0.75	0.65 to 0.83
2.8 (Frequency of anal pain while emptying bowels)	0.77	0.68 to 0.84
2.9 (Have you suffered from abdominal bloating)	0.26	0.11 to 0.40
2.10 (Frequency of abdominal pain or cramps)	0.69	0.56 to 0.78
Mean	0.71	
Constipation-related therapies		
3.1 (Drink at least 1.5 liters of fluids a day)	0.20	0.02 to 0.37
3.2 (Eat at least 2 pieces of fruit a day)	0.18	0.01 to 0.35
3.3 (Eat at least 3 tablespoons of vegetables a day)	0.15	−0.02 to 0.33
3.4.1 [Eat whole grains (roughly processed, containing bran, etc.) daily]	1.00	0.10 to 0.30
3.4.2 (Eat chili or spicy food)	0.38	0.14 to 0.56
3.5 (Frequency of laxatives to soften your stools)	0.73	0.62 to 0.81
3.6 (A special diet or foods to soften your stools)	0.48	0.25 to 0.70
3.7 (Use an enema to help pass stools)	0.40	0.06 to 0.73
3.8 (Irrigate rectum)	0.49	0.05 to 0.92
Mean	0.45	
Fecal continence		
4.1 (Frequency of accidentally pass small amounts of feces)	0.65	0.50 to 0.75
4.2 (Frequency of accidentally pass large amounts of solid feces)	0.64	0.49 to 0.74
4.3 (Feel a strong urge to empty bowels before reaching the toilet)	0.79	0.71 to 0.85
4.4 (Frequency of accidentally passing watery stools)	0.70	0.58 to 0.79
4.5 (Frequency of accidentally passing wind)	0.27	−0.01 to 0.47
Mean	0.61	

Table 3 (*continued*)

Table 3 (*continued*)

Item[†]	κ[‡]	95% CI
Anorectal sensation and voluntary contractions		
5.1 (Urge to empty your bowels before you went to the toilet)	0.68	0.54 to 0.77
5.2 (Duration to control bowels after urge sensation)	0.46	0.23 to 0.61
5.3 (Frequency of hurrying to the toilet in time)	0.57	0.39 to 0.70
5.4 (Differentiate between flatulence, diarrhea and solid/hard stools)	0.22	−0.09 to 0.44
Mean	0.48	
Urinary continence		
6.1 (Frequency of urination)	0.49	0.28 to 0.64
6.2 (Able to empty your bladder in one go)	0.66	0.52 to 0.76
6.3 (Strain during urination)	0.67	0.54 to 0.77
6.4 (Frequency of accidentally losing urine)	0.63	0.48 to 0.74
6.5 (Amount of urine lost on average)	0.74	0.64 to 0.82
6.7 (Frequency of going to the toilet during the night)	0.64	0.46 to 0.76
6.8 (Times of bladder infection in the past 6 months)	0.75	0.65 to 0.83
6.9 (Times of being treated for a bladder infection in the past 6 months)	0.74	0.63 to 0.82
Mean	0.67	
Obstetric- and gynecologic history		
7.1 (Have you ever been through childbirth)	1.00	1.00 to 1.00
7.7 (Uterus removal)	0.79	0.39 to 1.19
7.8 (Something is hanging out through vagina during defecation)	0	0 to 0
Mean	0.60	
Pelvic floor related medical history		
8.2 (Stoma for removing feces)	−0.01	−0.03 to 0
8.3 (Blood and/or mucous in stools)	0.61	0.42 to 0.81
8.4 (Injury to anus, apart from during childbirth or an operation)	−0.02	−0.04 to 0
8.6 (Medical conditions influencing bowel function in the family)	0.34	0.16 to 0.51
8.7 (Take medicines at the moment)	0.34	−0.04 to 0.71
Mean	0.25	

Answers to open-ended questions are not shown here. [†], simplified questions in comparison to the questionnaire; [‡], Cohen's kappa (κ) coefficient. DeFeC, Defecation and Fecal Continence; CI, confidence interval.

median κ coefficient was 0.64 (IQR, 0.34–0.74).

Reliability of the incorporated criteria and DeFeC scoring systems

We found that the unweighted κ coefficient of the Rome IV criteria for functional constipation was 0.65, indicating a substantial level of agreement between the test and re-test, while the κ coefficient of the Rome IV criteria for fecal incontinence was 0.52, i.e., of moderate agreement (*Table 4*). Furthermore, the ICC for the Wexner incontinence score was 0.74, which indicated substantial agreement, whereas,

Table 4 Reproducibility of the diagnostic criteria and scoring systems for fecal incontinence and constipation

Diagnostic criteria and scoring systems	Reproducibility		Agreement level
	Kappa coefficient (95% CI)	ICC (95% CI)	
Rome IV criteria			
Functional constipation	0.65 (0.49–0.81)	–	Substantial
Functional fecal incontinence	0.52 (0.24–0.81)	–	Moderate
Scores			
Agachan constipation score	–	0.88 (0.68–0.92)	Perfect
Wexner incontinence score	–	0.74 (0.63–0.81)	Substantial

ICC, intraclass correlation coefficient; CI, confidence interval.

for the Agachan constipation score, it was 0.88, indicating perfect agreement.

Discussion

We translated the Groningen DeFeC questionnaire into Chinese. We found it a feasible and reproducible screening tool for the Chinese population for bowel dysfunctions such as fecal incontinence and constipation.

To assess whether the questionnaire was understandable, we carried out a test-retest, based on which we found that the reproducibility level of different domains varied between fair and substantial, while the reproducibility level of diagnostic criteria and scoring systems for fecal incontinence and constipation ranged between moderate and perfect. Notably, none of the respondents found the questionnaire difficult to understand. The median time of 20 min during the first completion of the questionnaire was slightly longer than in the case of the Dutch version of the DeFeC questionnaire, which bore a median time of 15 min to complete (16). However, none of the patients reported that the questionnaire was too lengthy.

We conducted a test-retest analysis of the demographic questions regarding age, sex, residence province, and education, and the results showed perfect agreement. The analysis of the κ value showed good consistency of answers to the constipation-related questions about food.

Although the agreement level of the domains was not perfect, and one domain was even fair, the agreement level for the previously validated criteria (i.e., the Rome IV criteria and Wexner/Agachan score) was higher than those for the domains and one was perfect. This indicates that the Chinese version of the questionnaire can be used to screen

the presence of fecal incontinence or constipation and their co-occurrence and severity.

Moreover, the moderate agreement level regarding the symptoms and possible causative factors indicates that this questionnaire can be used to screen for possible underlying causes to either apply adequate treatment or send the patient for a diagnostic test, which would confirm the initial diagnosis of the cause. This, in turn, can speed up diagnosis and treatment and optimize their outcomes.

Since fecal incontinence is often accompanied by urinary incontinence according to literature (25), we investigated the κ coefficient value of urinary continence as well. We found it to be 0.67, indicating substantial agreement. The pelvic floor-related medical history was in fair agreement, which might be due to the limited number of pelvic operations in the general population (26).

In the current study, we did not perform a diagnostic validity test of sensitivity and specificity for constipation and fecal incontinence because the diagnostic validity was already proven by Meinds *et al.* for the Dutch population. This was done by showing that the sensitivity and specificity of the DeFeC questionnaire were relatively high when anorectal manometry was used as the gold standard (16). Regarding the other defecation scoring systems incorporated in the current study, such as the Agachan constipation score and the Wexner incontinence score, we did not perform the validation again in the present study because these scores have already been widely applied in previous studies on the Chinese population (27-29).

After translation and adjustment of the question items according to the cultural situation of the Chinese population, the questionnaire still demonstrated good reproducibility and feasibility, indicating good

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comprehension of the questionnaire among the Chinese people. This paves the way for future studies because the DeFeC questionnaire provides the possibility of a comprehensive evaluation of the epidemiology of bowel dysfunction and related symptoms, as well as the risk characteristics that apply to the Chinese population.

There are still some limitations in the current study. First, the DeFeC questionnaire contains open questions; therefore, we were unable to validate the total content. However, certain questions cannot be answered in a different form; for instance, questions about occupation or doses of medicines used by the respondents. Second, because this survey was performed anonymously, we could not clarify some respondents' illogical answers; therefore, we had to exclude data from those respondents from the analysis. There are also some strengths of our study. The questionnaires were filled in online and anonymously, decreasing respondents' embarrassment level because defecation problems remain social taboos.

Conclusions

The DeFeC questionnaire has good feasibility and reproducibility and can be applied in the clinical and research settings among the Chinese population.

Acknowledgments

Footnote

References

1. Bharucha AE, Wald A. Chronic Constipation. Mayo Clin Proc 2019;94:2340-57.
2. Rao SS, Bharucha AE, Chiarioni G, et al. Functional Anorectal Disorders. Gastroenterology 2016. doi: 10.1053/j.gastro.2016.02.009.
3. Meinds RJ, van Meegdenburg MM, Trzpis M, et al. On the prevalence of constipation and fecal incontinence, and their co-occurrence, in the Netherlands. Int J Colorectal Dis 2017;32:475-83.
4. Mearin F, Lacy BE, Chang L, et al. Bowel Disorders.

Gastroenterology 2016;S0016-5085(16)00222-5.

5. Agachan F, Chen T, Pfeifer J, et al. A constipation scoring system to simplify evaluation and management of constipated patients. Dis Colon Rectum 1996;39:681-5.

6. Vaizey CJ, Carapeti E, Cahill JA, et al. Prospective comparison of faecal incontinence grading systems. Gut 1999;44:77-80.

7. Renzi A, Brillantino A, Di Sarno G, et al. Five-item score for obstructed defecation syndrome: study of validation. Surg Innov 2013;20:119-25.

8. Jorge JM, Wexner SD. Etiology and management of fecal incontinence. Dis Colon Rectum 1993;36:77-97.

9. Emmertsen KJ, Laurberg S. Low anterior resection syndrome score: development and validation of a symptom-based scoring system for bowel dysfunction after low anterior resection for rectal cancer. Ann Surg 2012;255:922-8.

10. Digesu GA, Panayi D, Kundi N, et al. Validity of the Rome III Criteria in assessing constipation in women. Int Urogynecol J 2010;21:1185-93.

11. de la Portilla F, Calero-Lillo A, Jiménez-Rodríguez RM, et al. Validation of a new scoring system: Rapid assessment faecal incontinence score. World J Gastrointest Surg 2015;7:203-7.

12. Hou XT, Pang D, Lu Q, et al. Validation of the Chinese version of the low anterior resection syndrome score for measuring bowel dysfunction after sphincter-preserving surgery among rectal cancer patients. Eur J Oncol Nurs 2015;19:495-501.

13. Hsu LF, Hung CL, Kuo LJ, et al. An abbreviated Faecal Incontinence Quality of Life Scale for Chinese-speaking population with colorectal cancer after surgery: cultural adaptation and item reduction. Eur J Cancer Care (Engl) 2017. doi: 10.1111/ecc.12547.

14. Tsai YJ, Yang YW, Lan YT. Translation and validation of the traditional Chinese version of the Constipation Severity Instrument. J Chin Med Assoc 2021;84:299-302.

15. Ma X, Lu Q, Lu Y, et al. Validation of the Constipation Risk Assessment Scale (CRAS) in Chinese cancer patients. Eur J Oncol Nurs 2021;50:101895.

16. Meinds RJ, Timmerman MEW, van Meegdenburg MM, et al. Reproducibility, feasibility and validity of the Groningen Defecation and Fecal Continence questionnaires. Scand J Gastroenterol 2018;53:790-6.

17. Verkuijl SJ, Meinds RJ, Trzpis M, et al. The influence of demographic characteristics on constipation symptoms: a detailed overview. BMC Gastroenterol 2020;20:168.

18. van Meegdenburg MM, Trzpis M, Broens PM. Fecal incontinence and parity in the Dutch population: A cross-sectional analysis. United European Gastroenterol J

2018;6:781-90.

19. Al-Saidi AMA, Verkuijl SJ, Hofker S, et al. How Should the Low Anterior Resection Syndrome Score Be Interpreted? Dis Colon Rectum 2020;63:520-6.

20. van Meegdenburg MM, Meinds RJ, Trzpis M, et al. Subtypes and symptoms of fecal incontinence in the Dutch population: a cross-sectional study. Int J Colorectal Dis 2018;33:919-25.

21. Gagnier JJ, Lai J, Mokkink LB, et al. COSMIN reporting guideline for studies on measurement properties of patient-reported outcome measures. Qual Life Res 2021;30:2197-218.

22. Herdman M, Rajmil L, Ravens-Sieberer U, et al. Expert consensus in the development of a European health-related quality of life measure for children and adolescents: a Delphi study. Acta Paediatr 2002;91:1385-90.

23. The Rome Foundation [Internet]. Rome IV criteria. [cited 2016 January 16]. Available online: https://theromefoundation.org/rome-iv/rome-iv-criteria/

24. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics 1977;33:159-74.

25. Panicker JN, Marcelissen T, von Gontard A, et al. Bladder-bowel interactions: Do we understand pelvic organ cross-sensitization? International Consultation on Incontinence Research Society (ICI-RS) 2018. Neurourol Urodyn 2019;38 Suppl 5:S25-34.

26. Feinstein AR, Cicchetti DV. High agreement but low kappa: I. The problems of two paradoxes. J Clin Epidemiol 1990;43:543-9.

27. Sun J, Bai H, Ma J, et al. Effects of flaxseed supplementation on functional constipation and quality of life in a Chinese population: A randomized trial. Asia Pac J Clin Nutr 2020;29:61-7.

28. Sun XL, Wen K, Chen YH, et al. Long-term outcomes and quality of life following ligation of the intersphincteric fistula tract for high transsphincteric fistulas. Colorectal Dis 2019;21:30-7.

29. Wei L, Luo Y, Zhang X, et al. Topical therapy with rhubarb navel plasters in patients with chronic constipation: Results from a prospective randomized multicenter study. J Ethnopharmacol 2021;264:113096.