

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Integrative Medicine Research

journal homepage: www.imr-journal.com

Case Report

An examination of naturopathic treatment of non-specific gastrointestinal complaints: comparative analysis of two cases

Tristan Carter ^a, Joshua Z. Goldenberg ^{b,c}, Amie Steel ^{c,*}^a Endeavour College of Natural Health, Brisbane, Queensland, Australia^b National University of Natural Medicine, Portland, Oregon, United States^c Australian Research Centre in Complementary and Integrative Medicine, Faculty of Health, University of Technology Sydney, Ultimo, Sydney, Australia

ARTICLE INFO

Article history:

Received 22 May 2019

Received in revised form 7 August 2019

Accepted 7 August 2019

Available online 13 August 2019

Keywords:

Case reports

Functional colonic diseases

Naturopathy

ABSTRACT

Background: Functional gastrointestinal disorders (FGID) affect more than one-third of the general population and contribute a considerable burden on the health and wellbeing of the community and the economy. This study aims to examine the treatment approaches and outcomes of naturopathic management of individuals presenting with a non-specific FGID.

Methods: We report a comparison of two clinical case studies of patients being treated by a naturopath for a functional gastrointestinal disorder. The care was provided by two different student practitioners under the supervision of an industry qualified mentor within a multidisciplinary academic clinic at the Endeavour College of Natural Health. A student practitioner and student observer conduct consultations under the supervision of an industry qualified mentor. The outcomes of care were measured by the Gastrointestinal Symptom Rating Scale.

Results: Clinical notations partially correlate to Jane's outcomes measured by gastrointestinal rating scale scores, which remain stable. Significant changes in Rona's gastrointestinal rating scale scores equate to only generalizable minimal clinical notations.

Conclusions: The holistic and individualised approach core to naturopathic medicine practice is also informed by traditional methods, research evidence and the pragmatic needs of the patient. The emphasis within naturopathic treatment approaches on dietary changes and lifestyle prescription alongside other ingestive therapies such as herbal and nutritional medicine underscores the need for clinical research designs which support evaluation of complex interventions in real-world settings.

© 2019 Korea Institute of Oriental Medicine. Publishing services by Elsevier B.V.

1. Introduction

Functional gastrointestinal disorders (FGID) are chronic or recurring complaints, characterised by concurrent gastrointestinal (GIT) symptoms incorporating abdominal pain/discomfort, heartburn, dyspepsia, bloating and altered bowel movements (diarrhoea/constipation) not always explainable by structural or biochemical aberrations.^{1,2} FGID affect more than one-third of the general population³ and contribute a considerable burden on the health and wellbeing of the community and the economy⁴ attributing significant direct health care costs and indirect costs related to diminished work productivity.^{3,5} This cluster of conditions are understood to occur due to a complex interaction of biological,

psychological and social factors⁶ associated with psychological distress, disruption of sleep and psychiatric disorders.⁵ In fact, psychological stress may be an important factor in FGID pathogenesis with positive associations implicated between psychological stress, symptom severity, fatigue,⁷ and abnormal immunity.⁸ FGID may also be deemed conditions of intestinal immune dysfunction, connected with intestinal microbiota imbalances, with inflammation generally observed in FGID consistent with immune activation.⁹

Health-related quality of life (HRQoL) is significantly affected in individuals with FGID.¹⁰ As such, the holistic assessment of emotional, social and physical functions associated with HRQoL is important for clinicians to understand the severity of individual patient complaints and the outcomes of treatment.^{5,11} Conventional treatment of FGID includes loperamide, calcium polycarbophil, polyethylene glycol 3350 and smooth muscle relaxants,¹² all demonstrated as safe and effective agents, if taken in accordance with instructions.^{13–16} Tricyclic antidepressants are also utilized in conventional treatment, however, numerous side

* Corresponding author at: Faculty of Health University of Technology Sydney Level 8, Building 10 235-253 Jones St Ultimo NSW 2007, Sydney, Australia.

E-mail address: Amie.steel@uts.edu.au (A. Steel).

effects limit their use to moderate and severe cases.¹⁷ Of note, HRQoL is often negatively impacted by medication side effects prescribed for patients with FGID.¹⁸ Adverse effects associated with the use of these agents include constipation, fatigue, rashes, nausea, bloating, cramping, gas, headaches, sleep problems and restlessness.^{19–21}

Practiced in every global region, modern naturopathy is considered a system of healthcare evolved by merging the traditional medicine of each country with principles, theories, modalities and traditions.²² Naturopathic treatment philosophy affirms optimum general health commences with effective digestion. The ability to appropriately digest and absorb nutrients and eliminate waste products is positioned within naturopathy as critical. Equally, naturopaths have long asserted the link between digestive dysfunction and seemingly unrelated conditions influencing the immune system, skin health, inflammation and energy production.^{23,24} Generally, naturopaths utilize integrative treatments incorporating clinical nutrition and dietary modifications, herbal medicine, lifestyle counselling and physical modalities.²⁴ Specific dietary interventions, including therapeutic diets, plus products including herbal tinctures/infusions and digestive enzymes, eating hygiene/mindful eating and/or mind-body techniques such as exercise and meditation, as often prescribed by naturopaths for functional bowel disorders, are advocated by a panel of industry experts.²⁵ Treatments prescribed by naturopaths for irritable bowel syndrome (IBS)—an internationally significant FGID—have been explored,^{25–31} and while some of this research suggests possible clinical benefits for generalised FGID, minimal research is currently available exploring this.

This case series endeavours to report foundational information about naturopathic clinical treatment of FGID for the purpose of identifying potential avenues that warrant exploration in future clinical studies. With this in mind, this study reports the gastrointestinal symptom outcomes of two individuals who received naturopathic care for FGID. The analysis aims to examine the treatment approaches and outcomes of naturopathic management of individuals presenting with non-specific FGID.

2. Methods

2.1. Study design

A comparison of two clinical case studies of patients being treated by a naturopath for FGID.

2.2. Setting

Wellnation Clinics are multidisciplinary environments specifically designed for natural health students attending Endeavour College of Natural Health, utilized by both students and the general public, in which a student practitioner and student observer conduct consultations under the supervision of a naturopath mentor. The mentor is trained to the minimum requirements for naturopaths in Australia (Bachelor degree)³² and must have at least five years clinical experience. Six clinical locations are located in Brisbane, Melbourne, Sydney, Adelaide, Perth and Gold Coast. Commencing in 2016 as a national project integrated into the client file management system, the patient reported outcome measures (PROMS) are a cluster of condition-specific instruments, which utilise patient perspectives to amass health data, allowing practitioners to gain qualitative, validated measures of patient health status and the outcomes of treatments. To date, seven PROMS have been implemented nationally across all Wellnation Clinic systems.

2.3. Identification of cases

Proposed rationale and limitations of the available records are discussed below. Cases were selected in accordance with the following *a priori* inclusion and exclusion criteria.

2.3.1. Inclusion criteria

Participants require completion of the Gastrointestinal Symptom Rating Scale (GSRS), more than once, at a Wellnation Clinic with the first GSRS instrument completed in an initial naturopathic consultation, or within two weeks of an initial naturopathic consultation. Naturopathic consultations span at least two weeks. Participants presented with gastrointestinal disorder/s as their primary presenting issue resulting in the creation and allocation of a treatment plan.

2.3.2. Exclusion criteria

To ensure personalised services and consistency in treatment, cases were only included if each client attended at least three separate consultations in which both the student practitioner and supervisor remained unchanged.

2.4. Data collection

Retrospective data was collated over a two week period from 3rd December to 14th December 2018. Data was collected from both electronic clinical files and hard copy client case files, located at separate Wellnation Clinic locations, with PROMS calculated through an electronic survey-based Gastrointestinal Symptom Rating Scale (GSRS). Required data was entered into a chart extraction document to centralise and consolidate information. Data collection commenced by identifying, via de-identified electronic records, all Wellnation Clinic clients having completed the GSRS since the implementation of the current Wellnation Clinic electronic data system in 2016. Data was then manually filtered. Patient Identification Codes were extracted from the de-identified database records and provided to clinic management staff, who confirmed which records related to clients who consulted with a naturopath. Two participants were identified for inclusion and were contacted for permission to include their cases in the analysis (release forms provided to the journals). Case files for the identified participants were copied by clinic management staff and released to the research team.

2.5. Data instrument

GSRS, a brief yet comprehensive disease-specific rating scale measuring patient-reported outcomes,³³ was developed in resemblance to the Comprehensive Psychopathological Rating Scale (CPRS) and consists of fifteen items formulated for assessment of common gastrointestinal symptoms.³⁴ Combined into five symptom subclasses representing reflux, abdominal pain, indigestion, diarrhoea and constipation,^{33,35} scores for each item range from zero to three, rated according to intensity, frequency, duration and impact on daily living, with a score of zero indicating an absence of symptoms and a score of three indicating extreme symptoms.³⁴ Scores are aggregated and a cumulative score is calculated with higher scores indicating more severe digestive states, score ranges have been interpreted by Endeavour College of Natural Health Office of Research to assist clinical students.³⁶

GSRS analysis references a comprehensive table, refer to [Table 1](#), incorporating a breakdown into fifteen individual GSRS items with scores listed for each item per consultation, for both cases. This table has been utilised to determine subjective changes in gastrointestinal severity, based upon the individual scores for each question and the cumulative GSRS scores for each consultation. GSRS score

Table 1
Gastrointestinal Symptom Rating Scale (GSRS) scores* for individuals receiving naturopathic care for non-specific gastrointestinal complaints

Symptoms	CASE 1						CASE 2							
	Baseline	Visit 2		Visit 3		Outcome	Baseline	Visit 2		Visit 3		Visit 4	Outcome	
	Score	Score	Δ^a	Score	Δ^b	Total Δ	Score	Score	Δ^a	Score	Δ^b	Score	Δ^c	Total Δ
1) Abdominal pains	2	1	-1	1	0	-2	1	0	-1	0	0	0	0	-1
2) Heartburn	0	0	0	2	2	+2	1	1	0	0	-1	0	0	-1
3) Acid regurgitation	1	0	-1	2	2	+1	0	0	0	0	0	0	0	0
4) Sucking sensations in the epigastrium	1	2	1	2	0	-1	0	0	0	0	0	0	0	0
5) Nausea and vomiting	1	1	0	1	0	0	1	0	-1	0	0	0	0	-1
6) Borborygmus (stomach rumbling and noise)	3	3	0	2	-1	-1	1	0	-1	0	0	0	0	-1
7) Abdominal distension	3	3	0	2	-1	-1	2	1	-1	2	1	0	-2	-2
8) Eructation (Burping)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9) Increased flatus	2	2	0	1	-1	-1	1	0	-1	1	1	0	-1	-1
10) Decreased passage of stools	2	1	-1	3	2	0	0	0	0	0	0	0	0	0
11) Increased passage of stools	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12) Loose stools	1	0	-1	0	0	-1	0	0	0	0	0	0	0	0
13) Hard stools	3	3	0	2	-1	-1	1	1	0	1	0	0	-1	-1
14) Urgent need for defecation	2	0	-2	1	1	-1	0	0	0	0	0	0	0	0
15) Feeling of incomplete evacuation	3	3	0	3	0	-3	3	2	-1	1	-1	0	-1	-3
Cumulative score	24	19	-5	22	3	-2	11	5	-6	5	0	0	-5	-11

Δ^a = Change in score between baseline and visit 2; Δ^b = change in score between visit 2 and 3; Δ^c = change in score between visit 3 and 4; Total Δ = change in score between baseline and final visit.

* GSRS Scale: None to minimal gastrointestinal issues (0–9); Minimal gastrointestinal issues (10–19); Moderate gastrointestinal issues (20–29); Moderate to severe gastrointestinal issues (30–39); Severe gastrointestinal issues (40–45).

differences between consultations and overall differences for each case have also been referenced.

2.6. Ethics approval

As a retrospective case analysis, this study is considered negligible risk and as such pursuing ethics approval was not considered necessary however this study was conducted in accordance with the national ethical guidelines on human research projects.³⁷ Pseudonym's were allocated to both participants and non-essential personal information was modified or generalised to protect each individual's identity. Participant's consent to the publication of information in academic publications was obtained in writing.

3. Results

3.1. Case 1: *Jane*

3.1.1. Patient information

Jane is a 21-year-old female Caucasian with a main presenting issue of moderate generalised digestive complaints experienced as a reaction to certain foods. Jane reported a general feeling of being unwell when using the bathroom over the last five years. Initially, Jane identified a brief history of severe painful constipation (approximately one week), intermittent uncomfortable diarrhoea, abdominal discomfort with stabbing pain in the upper stomach, indigestion, increases in flatulence and bloating with a sensitive upper stomach causing issues with passing stool and fluctuations in stool quality. Further, Jane also described increased levels of stress, recurrent common colds, slow wound healing scarring badly and bruising easily, hay fever, fatigue, brain fog, irritability and menstrual difficulties. Jane identified specific foods as causing either uncomfortable diarrhoea (dairy) or constipation (grains).

3.1.1.1. Consultation 1 (Week 1).

3.1.1.1.1. Clinical findings. The clinician observed Jane had restricted pupils and a full tongue. Her nails were documented by the clinician to have "a few spots" and good capillary return. Jane's baseline GSRS score was 24.

3.1.1.1.2. Diagnostic assessment. The clinician assessed Jane as having a lowered GIT function resulting in poor nutrient assimila-

tion, decreasing energy levels, a decreased appetite, poor immune function and irritability. The clinician formulated a working diagnosis of food sensitivities resulting in constipation, bloating and pain.

3.1.1.1.3. Therapeutic Intervention (see Supplementary Table 1). Jane was initially prescribed Iberogast - 50 ml (Flordis: NSW Australia), known also as STW5, administered as ten drops in water before meals and MultiGest Enzymes - 90 caps (BioCeuticals: NSW Australia), administered as one tablet with meals. The clinician also recommended eating hygiene practices, including deep breathing exercises, prior to eating, and mindful eating thoroughly chewing food, meditation, and increased consumption of various coloured plant-based foods, high-fibre foods and bone broth. She was also recommended to avoid specific foods observed to affect her GIT functioning.

3.1.1.2. Consultation 2 (Week 3).

3.1.1.2.1. Patient information. Jane reported a reduction in her stabbing pains and stress levels but a continuation of her reactions to foods, bloating, generalised pain and difficulty passing stools, being hard and painful to pass not feeling fully evacuated.

3.1.1.2.2. Clinical findings. The clinician identified the white spots on Jane's nails were no longer present and she had enlarged pupils. Jane's second GSRS calculated a score of 19, suggesting minimal gastrointestinal issues (Refer to Table 1).

3.1.1.2.3. Diagnostic assessment. The clinician documented their diagnostic assessment of Jane as indicating that she was experiencing stress and anxiety, as she had self-identified, due to her gut-brain axis compromising her neurotransmitter production. A working diagnosis of constipation was noted but no formal diagnosis against international criteria was recorded.

3.1.1.2.4. Therapeutic intervention (Refer to Supplementary Table 1). Jane was prescribed CalmX Tropical - 238gm (Metagenics: QLD, Australia), administered as one scoop in the morning and one at night. Initial lifestyle prescriptions were prescribed to Jane, including eating hygiene practices incorporating deep breathing exercises, prior to eating, mindful eating thoroughly chewing food plus meditation, along with exercise. She was also recommended a range of dietary changes including: follow a low fermentable oligosaccharide, disaccharide, monosaccharide and polysaccharide (FODMAP) diet; consume herbal teas and lemon water; increased

intake of warming spices and prebiotic-rich foods plus continuation of high fibre foods, bone broth and the avoidance of specific foods.

3.1.1.3. Consultation 3 – (Week 5).

3.1.1.3.1. *Patient information.* Jane affirmed compliance of the low FODMAP diet, as prescribed in the second consultation, further confirming she was also avoiding dairy, onion and garlic. Jane reported a reduction in her symptoms of gas and bloating, stabbing pains and generalised pain. However, the clinician noted that Jane still reported experienced food sensitivity issues however no details of the specific symptoms were recorded.

3.1.1.3.2. *Clinical findings.* Jane's GSRS score was 22, suggesting moderate gastrointestinal issues (refer to [Table 1](#)).

3.1.1.3.3. *Diagnostic assessment.* There was no documented change to the diagnostic assessment at this stage.

3.1.1.3.4. *Therapeutic Intervention – (Refer to [Supplementary Table 1](#)).* No changes to Jane's treatment were prescribed other than the addition of self-massaging techniques. Previous dietary prescriptions were also reiterated along a recommendation for Jane to include whole grains and replace wheat with alternatives.

3.2. Case summary

Clinical notations only partially correlate to Jane's outcomes measured by GSRS scores. Overall, while case notes indicate Jane's gut is responding well to treatments with Jane suffering less gas, bloating and associated symptoms yet still suffering from constipation, pain and food sensitivity, GSRS scores remained stable.

3.2.1. Case 2: *Rona*

3.2.1.1. *Patient information.* Rona is a 21-year-old female Caucasian with main presenting issues of constipation and abdominal discomfort also acknowledging issues of fatigue, feeling sleepy after lunch napping during the day and taking up to one hour to fall asleep. Rona often wakes after the night's sleep unrefreshed, she also has a history of recurrent common colds plus hay fever. Rona stated she had consumed no gluten for a three-year period due to constipation and tiredness. All meals were causing bloating, except specific foods including cereals and gluten-free toast, constipation and stomach pain near the belly button within ten minutes of eating and dissipating between thirty minutes and two hours following eating. Rona confirmed her bowel movements are once per day, in the morning, however, she does not feel fully evacuated unless coffee is consumed. Without coffee, considerable straining is required to pass stool. The maternal side of Rona's family is gluten sensitive with her mother suffering from IBS.

3.2.1.2. Consultation 1 (Week 1).

3.2.1.2.1. *Clinical findings.* Rona's nails had ridges with thick white spots and her non-coated red pointy slightly scalloped tongue had a slight quiver. Rona's baseline GSRS score was 11, suggesting minimal gastrointestinal issues (refer to [Table 1](#)).

3.2.1.2.2. *Diagnostic assessment.* Based on the details of the case as presented, Rona's clinician documented her diagnostic assessment in which it was proposed that insufficient gastric secretions and microbiome imbalances were contributing to Rona's symptoms. The clinician provided a working diagnosis of IBS with gluten intolerance, however there was no evidence of assessing this criteria against international diagnostic criteria.

3.2.1.2.3. *Therapeutic Intervention (Refer to [Supplementary Table 2](#)).* Rona was initially prescribed a combination herbal formula containing *Matricaria chamomilla* (Chamomile), *Cynara scolymus* (Globe artichoke), *Taraxacum officinale* (Dandelion) (Root or leaf), *Althea officinalis* (Marshmallow) and *Lavandula angustifolia* (Lavender), administered as 5mls three times per day fifteen to twenty

minutes before food, suggested to be washed around the mouth and over tongue before swallowing

The clinician also recommended Rona increase the quantity of food and water she consumed and include apple cider vinegar in her diet. Daily consumption of proteins, increased fruit and vegetable consumption and eating a salad once per day were also prescribed. She was also recommended to practice sleep hygiene behaviours including avoiding all technology sixty minutes prior to bed.

3.2.1.3. Consultation 2 (Week 2).

3.2.1.3.1. *Patient information.* Rona reported decreased gastrointestinal pain and bloating however she still felt un-evacuated with her constipation unchanged.

3.2.1.3.2. *Clinical findings.* Rona's second GSRS score was 5, suggesting none to minimal gastrointestinal issues (refer to [Table 1](#)).

3.2.1.3.3. *Diagnostic assessment.* The clinician reiterated the initial working diagnosis of IBS.

3.2.1.3.4. *Therapeutic intervention (Refer to [Supplementary Table 2](#)).* The initial combination herbal formula was prescribed again to Rona. Initial lifestyle prescriptions were reiterated with the addition of mindful eating practices. Initial dietary prescriptions were also reiterated with the addition of limiting coffee consumption.

3.2.1.4. Consultation 3 (Week 3).

3.2.1.4.1. *Patient information.* As noted by the clinician, the Easter period was between consultations two and three. Rona confirmed a return of her bloating attributed to greater than usual consumption of alcohol and chocolate. Rona also acknowledged she moved her bowels once every one to two days with a hard and pebbly consistency. She had been consuming fewer meats and was instead consuming beans and lentils. She had also been adding protein powder to her smoothies to increase satiety.

3.2.1.4.2. *Clinical findings.* Rona's third GSRS score was 5, suggesting none to minimal gastrointestinal issues (refer to [Table 1](#)).

3.2.1.4.3. *Diagnostic assessment.* The clinician amended the working diagnosis of IBS from previous consultations to hormonal influence including dysbiosis.

3.2.1.4.4. *Therapeutic intervention (Refer to [Supplementary Table 2](#)).* All prescriptions were repeated with the addition of whole grains replacing gluten-free products.

3.2.1.5. Consultation 4 (Week 5).

3.2.1.5.1. *Patient information.* Rona confirmed feeling much better with considerable decreases in her bloating now exhibiting minimal indications. Rona confirmed the removal of gluten-free products from her diet now being replaced mainly with brown rice and quinoa.

3.2.1.5.2. *Clinical findings.* Rona's fourth GSRS score was 0, suggesting none to minimal gastrointestinal issues (refer to [Table 1](#)).

3.2.1.5.3. *Diagnostic assessment.* Rona's holistic assessment inferred a combination of measures contributed to positive treatment outcomes including dietary alterations, increased water consumption, ceasing the oral contraceptive pill and herbal support. A working diagnosis was not documented.

3.2.1.5.4. *Therapeutic intervention (Refer to [Supplementary Table 2](#)).* An individualised herbal formula to support sleep was prescribed to Rona, replacing the original herbal formula. The clinician identified a barrier to these treatments being Rona exercising in the evening and into the night, until 10 pm, three days per week.

3.2.1.6. *Case summary.* Significant changes in Rona's GSRS scores do not correlate to the generalizable minimal clinical notations. Despite the initial main presenting gastrointestinal complaint as constipation, a GSRS score was not recorded for this symptom subclass.

4. Discussion

This paper reports the analysis of two cases based on individuals who accessed naturopathic care for the treatment of FGID. The naturopathic treatments observed in both cases were consistent in the overall treatment types prescribed, being dietary modifications, lifestyle and herbal medicines. These types of treatments reflect the overall treatment categories reported to be used by naturopaths internationally.²⁴ Equally, a recent Delphi study reports that naturopaths with expertise in the treatment of IBS agreed that dietary interventions, herbal medicines and lifestyle interventions, including meditation, exercise and stress reduction, are important treatment considerations.²⁵ Further, a review of naturopathic and dietetic treatment approaches for functional bowel disorders found holistic assessment incorporating individualised dietary prescription optimises patient outcomes.³⁸ As such, our study highlights the importance placed on complex, multi-treatment intervention approaches by naturopaths within clinical care and suggests the treatments used in these cases aligns with the general approach employed by naturopaths globally. While future clinical research is needed to understand the true effectiveness of naturopathic care for FGID, it is important that such research encompasses multi-factorial treatment interventions with a priority placed on dietary modifications, lifestyle counselling and herbal formulas.

In attempts to aid digestive functioning and alleviate stress levels, lifestyle changes were prescribed by the clinicians, in both cases, incorporating mindful eating practices, meditation, exercise and sleep hygiene practices. Despite extensive evidence examining the benefits of mindful eating for the obese, emotional eaters and those suffering eating disorders,^{39–42} robust research lacks for FGID patients with limited available references focused on non-specific examples.⁴³ A meta-analysis has found mindfulness-based therapies, including meditation, may improve in FGID symptom severity.⁴⁴ The finding of this meta-analysis are bolstered by a study finding eight weeks of mindfulness training can substantially reduce IBS symptom severity in women.²⁷ Clinical research also suggests increased physical activity improves IBS symptoms.²⁸ However, as this research supporting mindfulness training and exercise has focused on IBS, the clinical effect may not transfer to individuals with FGID other than IBS. For this reason, further research examining meditation as a standalone intervention, separate to overarching mindfulness philosophies, and exercise regimes as treatments for non-specific gastrointestinal symptoms is required for non-IBS FGID patients.

Dietary changes recommended by the clinicians treating the individuals within our studies predominately emphasised plant-based foods. In both cases, increases in complex carbohydrates, fruit and vegetables plus a variety of whole grains and prebiotic rich foods were prescribed. A low FODMAP diet coupled with specific high fibre foods were further prescribed for Jane. Dietary fibre naturally manifests in many foods including cereals, vegetables, fruits and nuts functioning to alleviate constipation and facilitate bowel regularity,⁴⁵ and is asserted for the improvement of overall symptoms in patients with IBS.⁴⁶ Naturopathic texts emphasise the importance of a diet high in alkalising fruits and vegetables^{47,48} with the inclusion of whole grains further providing necessary dietary fibre, resistant starch and oligosaccharides.⁴⁹ Specific dietary prescriptions, such as the consumption of *Prunus domestica* (prunes), has also been found to benefit gastrointestinal function⁵⁰ and be more effective than *Plantago ovata* (psyllium) for the relief of bowel symptoms.⁵¹ A comparative randomised double-blind trial confirmed that prebiotic-rich foods containing short-chain fructo-oligosaccharides (FOS), as found in *Allium cepa* (onions), *Allium sativum* (garlic) and *Asparagus officinalis* (asparagus), decreased the intensity of digestive disorders.³¹ While only prescribed in one of the cases presented here, a low FODMAP

diet provides effective treatment in patients with functional gut symptoms^{26,52} and this may explain why it was prescribed to the individual with the more severe symptoms. Overall, the dietary changes prescribed by the naturopaths providing care in these two cases broadly align with the available evidence for the FGID symptoms by the patients. It is also important to acknowledge that not all recommendations were grounded in strong research evidence. However, in these instances, such as the prescription of warm lemon juice on rising, there was no evidence that the prescription was unsafe or ineffective and some preliminary evidence—either through traditional knowledge sources or mechanistic research—suggests that the prescription may have a clinical benefit.

Unique herbal formulas were prescribed in each case, a proprietary formula prescribed to Jane and individualised formulas prescribed to Rona. Jane was further prescribed digestive enzymes and a proprietary nutritional formula designed to assist with stress responses. Examined on a case by case basis, the pharmacological synergistic effects of phytomedicines may explain the therapeutic superiority of herbal drug combinations compared with single constituents.⁵³ Evidence supporting the exclusive effects of STW5 and digestive enzymes on FGID's remain marginal, however, a double-blind randomised placebo-controlled multi-centre trial demonstrated effectiveness of STW5 for IBS treatment.²⁹ Further, the effective management of specific IBS symptoms utilizing Biointol, comprised of beta glucans, inositol and a mixture of digestive enzymes similar to those prescribed to Jane, have also been demonstrated in clinical research.^{54,55} These same claims cannot be made of Rona's herbal treatment due to the individualised nature of the formula, however, research does suggest potential clinical value for each individual herb specific to Rona's case.^{56–67} While minimal evidence establishes the effectiveness of some commercial formulas for IBS treatment, research utilizing specific commercial preparations, exclusively for FGID, appears unexplored. Notwithstanding, the personalisation of individualised treatments, as prescribed in both cases, fosters opportunities to enhance understandings of real-world health implications.⁶⁸ Sizeable gaps in research examining individualised herbal prescriptions, not only exclusive to FGID's but across many conditions, require urgent attention from the naturopathic research community.

Overall, these cases suggest a potential clinical benefit to naturopathic care for FGID but due to the preliminary nature of case reports further clinical research is warranted. These cases also highlight both the value of standardised patient-reported outcome measures to document changes in health status as well as the limitations of such instruments when complex conditions that affect quality of life are being treated if HRQoL is not also evaluated.

The individualised nature of the care observed in these cases, however, reinforces the value of a pragmatic naturalistic trial design which rejects protocols and enables clinicians to prescribe to the needs of the patient. Previous research using a pragmatic design for naturopathic research has found positive effects for cardiovascular, diabetes, chronic pain, anxiety, multiple sclerosis, hepatitis C and menopausal symptoms.⁶⁹ This approach to clinical research has been explored within the context of naturopathic studies in a recent position paper by international naturopathic researchers.⁶⁸ Application of a pragmatic framework in conducting naturopathic gastrointestinal research would be needed to examine naturopathic interventions for FGID.

The findings of this case series should be viewed within the context of its strengths and limitations. Firstly, to strengthen this case series, to the best of our knowledge this is the first naturopathic case review on a GI condition. Also, standardised and accepted patient-reported outcomes were consistently utilized in both cases along with standardized case-taking and assessment forms. Further,

two different students enrolled into an internationally-recognised nationally-accredited training have directed the consultations, under separate qualified and experienced clinical supervisors. Within the limitations inherent to case study methodology, a small sample size and the inclusion of selection bias, deviating in selecting consecutive cases instead incorporating specific inclusion/exclusion criteria, impacts any potential for the addition of statistical analysis.⁷⁰ The secondary analysis of occasionally brief and ambiguous case notes, with some consultation data inadequately documented, may have resulted in errors in document analysis with nuances potentially lost hence the results generated cannot always be justified for general naturopathic community practice. Despite these limitations, these cases document clinical outcomes from naturopathic care in an under-researched condition and as such may provide the foundation for future clinical research on this topic.

In conclusion, these cases underline that the holistic and individualised approach core to naturopathic medicine practice is also informed by traditional methods, research evidence and the pragmatic needs of the patient. The emphasis within naturopathic treatment approaches on dietary changes and lifestyle prescription alongside other ingestive therapies such as herbal and nutritional medicine underscores the need for clinical research designs which support evaluation of complex interventions in real-world settings. Without such research, the efficacy, effectiveness and safety of naturopathic care will never be well understood.

Conflicts of interest

The authors have no conflicts of interest to declare.

Funding

TC was funded through the Endeavour College of Natural Health Student Summer Research Program while preparing this manuscript.

Ethical statement

As a retrospective case analysis, ethics approval was not considered necessary. It was conducted in accordance with the national ethical guidelines on human research projects and participant's consent is obtained.

Data availability

The data analysed during the current study are not publicly available due to patient confidentiality.

Author contributions

AS and TC conceived of the study. TC collected and analysed the data. TC, AS, and JG drafted the manuscript.

Acknowledgements

The authors would like to recognise the Associate Director (Research) at Endeavour College of Natural Health, Rebecca Reid, for her continued support in the coordination of many project related matters. The Wellnation Clinic team also deserves gratitude for their persistence in obtaining and retrieving clinical data and allowing access to electronic records.

Supplementary material

Supplementary tables on therapeutic interventions of Case 1 and 2 can be found in the online version at doi:<https://doi.org/10.1016/j.imr.2019.08.001>.

References

1. Lovell RM, Ford AC. Global prevalence of and risk factors for irritable bowel syndrome: a meta-analysis. *Clin Gastroenterol Hepatol* 2012;10:712–21, <http://dx.doi.org/10.1016/j.cgh.2012.02.029>, e4.
2. World Gastroenterology Organisation. *Coping with common GI symptoms in the community: A global perspective on heartburn, constipation, bloating, and abdominal Pain/Discomfort - introduction*. [WGO - Global Guidelines]; 2019. Available from: <http://www.worldgastroenterology.org/guidelines/global-guidelines/common-gi-symptoms/common-gi-symptoms-english> accessed 24/01/2019 2019.
3. Koloski NA, Talley NJ, Boyce PM. Epidemiology and health care seeking in the functional GI disorders: a population-based study. *Am J Gastroenterol* 2002;97:2290–9.
4. Talley N. Functional gastrointestinal disorders as a public health problem. *Neurogastroenterol Motil* 2008;20:121–9.
5. Drossman DA, Creed FH, Olden KW, Svedlund J, Toner BB, Whitehead WE. Psychosocial aspects of the functional gastrointestinal disorders. *Gut* 1999;45:1125, <http://dx.doi.org/10.1136/gut.45.2008.ii25>.
6. Levy RL, Olden KW, Naliboff BD, Bradley LA, Francisconi C, Drossman DA. Psychosocial aspects of the functional gastrointestinal disorders. *Gastroenterology* 2006;130:1447–58, <http://dx.doi.org/10.1053/j.gastro.2005.11.057>.
7. Chang L. Review article: epidemiology and quality of life in functional gastrointestinal disorders. *Aliment Pharmacol Ther* 2004;20:31–9, <http://dx.doi.org/10.1111/j.1365-2036.2004.02183.x>.
8. Wu JC. Psychological co-morbidity in functional gastrointestinal disorders: epidemiology, mechanisms and management. *J Neurogastroenterol Motil* 2012;18:13–8, <http://dx.doi.org/10.5056/jnm.2012.18.1.13> [published Online First: 01/16].
9. Keely S, Walker MM, Marks E, Talley NJ. Immune dysregulation in the functional gastrointestinal disorders. *Eur J Clin Invest* 2015;45:1350–9.
10. Mönnikes H. Quality of life in patients with irritable bowel syndrome. *J Clin Gastroenterol* 2011;45:S98–101, <http://dx.doi.org/10.1097/MCG.0b013e31821bf44>.
11. Spiegel BMR. Patient-reported outcomes in gastroenterology: clinical and research applications. *J Neurogastroenterol Motil* 2013;19:137–48, <http://dx.doi.org/10.5056/jnm.2013.19.2.137> [published Online First: 04/16].
12. Longstreth GF, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller RC. Functional bowel disorders. *Gastroenterology* 2006;130:1480–91.
13. Lääveri T, Sterne J, Rombo L, Kantele A. Systematic review of loperamide: no proof of antibiotics being superior to loperamide in treatment of mild/moderate travellers' diarrhoea. *Travel Med Infect Dis* 2016;14:299–312.
14. Toskes P, Connery K, Ritchey T. Calcium polycarbophil compared with placebo in irritable bowel syndrome. *Aliment Pharmacol Ther* 1993;7:87–92.
15. DiPalma JA, DeRidder PH, Orlando RC, Kolts BE, vB Cleveland M. A randomized, placebo-controlled, multicenter study of the safety and efficacy of a new polyethylene glycol laxative. *Am J Gastroenterol* 2000;95:446.
16. Poynard T, Regimbeau C, Benhamou Y. Meta-analysis of smooth muscle relaxants in the treatment of irritable bowel syndrome. *Aliment Pharmacol Ther* 2001;15:355–61.
17. Rahimi R, Nikfar S, Rezaie A, Abdollahi M. Efficacy of tricyclic antidepressants in irritable bowel syndrome: a meta-analysis. *World J Gastroenterol* 2009;15:1548.
18. Grundmann O, Yoon SL. Complementary and alternative medicines in irritable bowel syndrome: an integrative view. *World J Gastroenterol* 2014;20:346.
19. Medline Plus. Available from: <https://medlineplus.gov/druginfo/meds/a682280.html>, 2018.
20. Medline Plus, 3350 Available from: <https://medlineplus.gov/druginfo/meds/a603032.html>, 2018.
21. Medline Plus. Available from: <https://medlineplus.gov/antidepressants.html>, 2018.
22. World Naturopathic Federation. *About naturopathy*; 2018. Available from: <http://worldnaturopathicfederation.org/about-naturopathy/> accessed 29th January 2019.
23. Smith F. *An introduction to principles and practices of naturopathic medicine*. Toronto, ON: CCNM Press Inc; 2008.
24. World Naturopathic Federation [updated September, 2017. Naturopathic Philosophies, Principles and Theories 1-98]. Available from: <http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/White-Paper.FINAL.pdf>, 2017.
25. Goldenberg JZ, Ward L, Day A, Cooley K. Naturopathic approaches to irritable bowel syndrome—A delphi study. *J Altern Complement Med* 2018;00:1–7, <http://dx.doi.org/10.1089/acm.2018.0255>.
26. Gibson PR, Shepherd SJ. Evidence-based dietary management of functional gastrointestinal symptoms: the FODMAP approach. *J Gastroenterol Hepatol* 2010;25:252–8.

27. Gaylord SA, Palsson OS, Garland EL, et al. Mindfulness training reduces the severity of irritable bowel syndrome in women: results of a randomized controlled trial. *Am J Gastroenterol* 2011;106:1678.
28. Johannesson E, Simrén M, Strid H, Bajor A, Sadik R. Physical activity improves symptoms in irritable bowel syndrome: a randomized controlled trial. *Am J Gastroenterol* 2011;106:915–22, <http://dx.doi.org/10.1038/ajg.2010.480>.
29. Madisch A, Holtmann G, Plein K, Hotz J. Treatment of irritable bowel syndrome with herbal preparations: results of a double-blind, randomized, placebo-controlled, multi-centre trial. *Aliment Pharmacol Ther* 2004;19:271–9, <http://dx.doi.org/10.1111/j.1365-2036.2004.01859.x>.
30. El-Salhy M, Ystad SO, Mazzawi T, Gundersen D. Dietary fiber in irritable bowel syndrome (Review). *Int J Mol Med* 2017;40:607–13.
31. Paineau D, Payen F, Panserieu S, et al. The effects of regular consumption of short-chain fructo-oligosaccharides on digestive comfort of subjects with minor functional bowel disorders. *Br J Nutr* 2008;99:311–8.
32. Australian Register of Homeopaths. <http://www.aroh.com.au/Policies>, 2017; 2017 [accessed 6 Sep].
33. Kulich KR, Madisch A, Pacini F, et al. Reliability and validity of the Gastrointestinal Symptom Rating Scale (GSRS) and Quality of Life in Reflux and Dyspepsia (QOLRAD) questionnaire in dyspepsia: a six-country study. *Health Qual Life Outcomes* 2008;6:12, <http://dx.doi.org/10.1186/1477-7525-6-12>.
34. Svedlund J, Sjödin I, Dotevall G. GSRS—a clinical rating scale for gastrointestinal symptoms in patients with irritable bowel syndrome and peptic ulcer disease. *Dig Dis Sci* 1988;33:129–34, <http://dx.doi.org/10.1007/bf01535722>.
35. Revicki DA, Wood M, Wiklund I, Crawley J. Reliability and validity of the Gastrointestinal Symptom Rating Scale in patients with gastroesophageal reflux disease. *Qual Life Res* 1997;7:75–83.
36. Meridian Institute [updated October, 2001. 324-27]. Available from: <https://www.meridianinstitute.com/reports/headache/Appendix%20N.pdf>, 2001.
37. National Health and Medical Research Council, Updated 2018 [Available from: <https://nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018>, 2007.
38. Grace S, Barnes L, Reilly W, Vlass A, de Permentier P. An integrative review of dietetic and naturopathic approaches to functional bowel disorders. *Complement Ther Med* 2018;41:67–80, <http://dx.doi.org/10.1016/j.ctim.2018.09.004>.
39. Jordan CH, Wang W, Donatoni L, Meier BP. Mindful eating: trait and state mindfulness predict healthier eating behavior. *Pers Individ Dif* 2014;68:107–11.
40. Beshara M, Hutchinson AD, Wilson C. Does mindfulness matter? Everyday mindfulness, mindful eating and self-reported serving size of energy dense foods among a sample of South Australian adults. *Appetite* 2013;67:25–9.
41. O'Reilly GA, Cook L, Spruijt-Metz D, Black DS. Mindfulness-based interventions for obesity-related eating behaviours: a literature review. *Obes Rev* 2014;15:453–61.
42. Godsey J. The role of mindfulness based interventions in the treatment of obesity and eating disorders: an integrative review. *Complement Ther Med* 2013;21:430–9.
43. Pannowitz D. Clinical applications of mindful eating. *J Aust Tradit-Med So* 2015;21:168.
44. Aucoin M, Lalonde-Parsi M-J, Cooley K. Mindfulness-based therapies in the treatment of functional gastrointestinal disorders: a meta-analysis. *Evid Based Complement Altern Med* 2014;2014.
45. Dhingra D, Michael M, Rajput H, Patil RT. *Dietary fibre in foods: a review*; 2012.
46. Bijkerk CJ, De Wit NJ, Muris JWM, Whorwell PJ, Knottnerus JA, Hoes AW. Soluble or insoluble fibre in irritable bowel syndrome in primary care? Randomised placebo controlled trial. *BMJ* 2009;339:b3154.
47. Rastogi R, Rastogi S. Concept and role of diet as a component of Naturopathy and yoga therapy. *Indian J Tradit Know* 2017;16:S47–52.
48. Allen J, Montalto M, Lovejoy J, Weber W. Detoxification in naturopathic medicine: a survey. *J Altern Complement Med* 2011;17:1175–80.
49. Slavin J. Whole grains and digestive health. *Cereal Chem* 2010;87:292–6.
50. Lever E, Cole J, Scott SM, Emery PW, Whelan K. Systematic review: the effect of prunes on gastrointestinal function. *Aliment Pharmacol Ther* 2014;40:750–8, <http://dx.doi.org/10.1111/apt.12913>.
51. Attaluri A, Donahoe R, Valetin J, Brown K, Rao SSC. Randomised clinical trial: dried plums (prunes) vs. Psyllium for constipation. *Aliment Pharmacol Ther* 2011;33:822–8, <http://dx.doi.org/10.1111/j.1365-2036.2011.04594.x>.
52. Halmos EP, Power VA, Shepherd SJ, Gibson PR, Muir JG. A diet low in FODMAPs reduces symptoms of irritable bowel syndrome. *Gastroenterology* 2014;146:67–75, <http://dx.doi.org/10.1053/j.gastro.2013.09.046>, e5.
53. Wagner H, Ulrich-Merzenich G. Synergy research: approaching a new generation of phytopharmaceuticals. *Phytomedicine* 2009;16:97–110.
54. Ciacci C, Franceschi F, Purchiaroni F, et al. Effect of β -Glucan, Inositol and digestive enzymes in GI symptoms of patients with IBS. *Eur Rev Med Pharmacol Serv* 2011;15:637–43.
55. Portincasa P, Bonfrate L, Scribano ML, et al. Curcumin and fennel essential oil improve symptoms and quality of life in patients with irritable bowel syndrome. *J Gastrointest Liver Dis* 2016;25.
56. Srivastava JK, Shankar E, Gupta S. Chamomile: a herbal medicine of the past with bright future. *Mol Med Rep* 2010;3:895–901, <http://dx.doi.org/10.3892/mmr.2010.377>.
57. Chauhan ES, Jaya A. Chamomile an ancient aromatic plant—a review. *Med Sci* 2017;2:251–5.
58. Salem MB, Affes H, Ksouda K, et al. Pharmacological studies of artichoke leaf extract and their health benefits. *Plant Foods Hum Nutr* 2015;70:441–53, <http://dx.doi.org/10.1007/s11130-015-0503-8>.
59. Kemper KJ. *Dandelion (Taraxacum officinalis)*. Longwood Herbal Task Force; 1999, <http://www.mcpcedu/herbal/default.htm> Revised November 1999;1.
60. Rasool S, Sharma B. *Taraxacum officinale*: a high value less known medicinal plant. *Ann Plant Sci* 2014;3:908–15.
61. Battaglia S. *Lavandula angustifolia, lavandula latifolia and lavandula angustifolia x latifolia*; 2016.
62. Fedurco M, Gregorová J, Šebrlová K, et al. Modulatory effects of *Eschscholzia californica* alkaloids on recombinant GABAA receptors. *Biochem Res Int* 2015;2015.
63. Upton R, Dayu R. Skullcap *Scutellaria lateriflora* L.: an american nervine. *J Herb Med* 2012;2:76–96.
64. Agah S, Taleb A, Moeini R, Gorji N, Nikbakht H, Soltani-Kermanshahi M. Chamomile efficacy in patients of the irritable bowel syndrome. *Der Pharma Chemica* 2015;7:41–4.
65. Bundy R, Walker AF, Middleton RW, Marakis G, Booth JC. Artichoke leaf extract reduces symptoms of irritable bowel syndrome and improves quality of life in otherwise healthy volunteers suffering from concomitant dyspepsia: a subset analysis. *J Altern Complement Med* 2004;10:667–9.
66. Fisher C. *Materia medica of western herbs nelson*. NZ: Vitex Medica; 2009.
67. Braun L, Cohen M. *Herbs & natural supplements: an evidence-based guide*. 4 ed. Chatswood, NSW: Elsevier; 2015.
68. Schloss J, McIntyre E, Steel A, et al. Lessons from outside and within: Exploring advancements in methodology for naturopathic medicine clinical research. *J Altern Complement Med* 2019;25:1–6, <http://dx.doi.org/10.1089/acm.2018.0403>.
69. Oberg EB, Bradley R, Cooley K, et al. *Estimated effects of whole-system naturopathic medicine in select chronic disease conditions: a systematic review*; 2015.
70. Fogarty S, Wardle J. Integrative medicine case series: a clinician's guide to publication. *Adv Integr Med* 2015;2:147–51, <http://dx.doi.org/10.1016/j.aimed.2015.11.001>.