



Contents lists available at ScienceDirect

Advances in Integrative Medicine

journal homepage: www.elsevier.com/locate/aimed



Original Research Papers

Identification of the conditions that complementary medicine practitioners recommend gluten free diets for in Australia

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ARTICLE INFO

Article history:

Received 28 February 2018

Received in revised form 21 June 2018

Accepted 26 June 2018

Available online xxx

Keywords:

Complementary medicine practitioners

Naturopath

Nutrition

Gluten free diet

Coeliac disease

Conditions

ABSTRACT

Introduction: A gluten free diet (GFD) is indicated for the medical management of coeliac disease as well as gluten ataxia, dermatitis herpetiformis, and wheat allergy. Complementary medicine practitioners (CMPs) recommend removing gluten from the diet, but it is not known what symptoms or conditions they recommend gluten free diets for. The aim of this study is to describe for what conditions Australian naturopaths, Western herbalists and nutritionists (non-dietetic) recommend a gluten free diet.

Methods: This was a sub-group analysis nested within a cross-sectional survey of practitioners recruited through the PRACI practice-based research network and relevant professional associations. A 40-item survey collected information on sociodemographic characteristics, practice and professional characteristics and specific questions on gluten related disorders between February and August 2017. Data was described using frequencies and percentages along with one-way ANOVA to determine group differences.

Results: One hundred and forty-five complementary practitioners responded to the survey. The gastrointestinal conditions most frequently prescribed a GFD for were non-coeliac gluten sensitivity (99%), medically diagnosed coeliac disease (95.2%), inflammatory bowel disease (73.1%) and irritable bowel syndrome (60%). The most frequently prescribed GFDs for extra-intestinal conditions were skin conditions (60%), children with developmental disorders (53.1%), mental health conditions (46.2%) and weight management.

Discussion: Results suggest that given the broad application of GFDs by CMPs, there may be therapeutic benefits for conditions other than known gluten related disorders. However, in the absence of appropriate investigations for gluten related disorders, the recommendation and positive response to a GFD may be inadvertently treating an undiagnosed gluten related disorder. In addition, a GFD may also be inadvertently managing other unknown intolerances that require different clinical management.

Conclusion: This research highlights the need for further investigation into the potential benefits resulting from prescribing GFDs for conditions where there is no established evidence for the exclusion of dietary gluten.

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1. Introduction

Excluding gluten containing foods from the diet has become a popular choice by people in Australia. The main drivers of this trend are thought to be associated with the

popular belief that ‘gluten avoidance’ is a healthier way to eat [1], coupled with extensive marketing in Australia and throughout other parts of the world. In addition, food industry promoted gluten free products were estimated to yield \$1328 million USD in 2016 [2]. Nevertheless, strict adherence to a gluten free diet (GFD) is essential for the management of coeliac disease and plays a role in the treatment of gluten related disorders including, gluten ataxia, non-coeliac gluten sensitivity (NCGS), wheat allergy [3], and dermatitis herpetiformis [4].

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Coeliac disease (CD) is an autoimmune disorder resulting from an interaction between dietary, genetic and immunological factors. It is estimated that 1.2% of Australian men and 1.9% of Australian women are living with coeliac disease [5], with an estimated 80% of cases remaining undiagnosed [6]. Coeliac disease can present at any age with protean presentations [7,8]. NCGS is a disorder that exhibits similar symptoms to coeliac disease with the absence of specific biological markers of disease [9]. People with NCGS have symptom relief following removal of dietary gluten. The true prevalence of NCGS is not known but estimates suggest it affects between 0.6 to 6% of the Australian population [10].

The medical requirement for a GFD only makes up a small portion of the 20% of Australians reported to be following a GFD [11]. There has been a number of studies that have identified the potential benefits of following a GFD in conditions other than gluten related disorders [1]. However, it is proposed that many people who are receiving symptomatic relief from a GFD are doing so because of the inadvertent removal of fermentable carbohydrates or specific antigenic wheat proteins [12]; therefore, it is unnecessary to exclude all gluten containing grains [1].

It has been reported that the majority of GFDs are self-prescribed, or prescribed by a complementary medicine practitioner (CMP) often prior to the appropriate exclusion of gluten related disorders [11]. In addition, it has been found that people with non-coeliac gluten sensitivity (NCGS) are less receptive to conventional medicine and more receptive to complementary medicine [13]. To our knowledge, there have been no studies exploring what conditions CMPs recommend GFDs for. Therefore, this study aimed to describe the health conditions for which Australian naturopaths, Western herbalists and nutritionists (non-dietetic) recommend a gluten free diet.

2. Methods

2.1. Study design

A sub-group analysis of a cross-sectional survey of Australian naturopaths, nutritionists (non-dietetic) and Western herbal medicine practitioners.

2.2. Participants

The sample population comprised of 145 complementary medicine practitioners (i.e. naturopaths, nutritionists, Western herbalists) who were currently practicing in Australia and reported prescribing gluten free diets to patients. Due to the recruitment method we were unable to calculate a response rate for this study.

2.3. Measures

This GFD sub-study included items that measured sociodemographic characteristics such as age, gender, and practice location. Data on practice and professional characteristics were also collected through items measuring professional education (level of education and length of time since highest qualification) and length of time in full-time or part-time practice. Questions were also asked specifically focused on gluten related disorders including clinical management, and practice behaviours.

2.4. Data collection

The survey was administered electronically between February and August 2017 through the SurveyGizmo online platform. Recruitment was conducted through the Practitioner Research and Collaboration Initiative PRACI practice-based research network. The study was also advertised to practitioners through

professional associations including the Australian Natural Therapists Association and the Naturopaths and Herbalists Association of Australia.

2.5. Data analysis

Data were analysed in Stata14[®] statistical analysis software. Binary variables were created for the items: medically diagnosed with coeliac disease, gastrointestinal conditions recommend for gluten diets, and extra-intestinal conditions recommend for GFDs (e.g. respiratory disorders). Descriptive analysis (frequency and percentage) was conducted for age, gender, coeliac disease diagnosis, location, level of qualification, years since highest qualification, years as a CMP, recommendations of GFDs for selected conditions, communication styles, how well the communication was received, reason for not communicating with a general practitioner, further education choices and knowledge on gluten free disorder questions.

Chi square analysis was used to test associations between age, level of qualification, years in practice, type of gastrointestinal condition, type of extra-intestinal conditions, and recommending a GFD. Cramer's V was used to determine the strength of the associations.

3. Results

3.1. Demographic and practice characteristics

Question 1 of the survey asked participants if they prescribed GFDs in practice. There were 145 practitioners who answered yes to this question and completed the survey. Of these practitioners, 7.6% (n = 11) had been medically diagnosed with CD for 10.3 ± 2.46 years. 99.3% (n = 144) of practitioners recommended a GFD within their practice, and 50% (n = 73) personally followed a GFD.

The sample was mainly comprised of females (92.4%), with the majority of participants located in Victoria (30.5%), New South Wales (29.8%), and Queensland (26.4%). Sixty-five percent have attained a Bachelor degree with 13% possessing post-graduate qualifications. The majority of practitioners have achieved their highest qualification in the last 10 years (58%) and have been in practice as CMP for less than 10 years (58%). See Table 1 a summary of demographic information.

3.2. Health conditions that CM practitioners recommend a gluten free diet

The gastrointestinal conditions CMPs recommended a GFD for can be seen Table 2. Medically diagnosed coeliac disease was the condition with the most frequent recommendations for a GFD (95.2%), followed by patients medically diagnosed with NCGS (99%), inflammatory bowel disease (73%), and irritable bowel syndrome (60%).

Of those who recommended a GFD to patients who were diagnosed with NCGS, there was a medium statistically significant association with CM practitioner qualifications (p = 0.001) and years in practice (p = 0.013). Practitioners with higher qualifications or with more years in practice were more likely to recommend a GFD to patients with NCGS. There was also a medium significant association between level of qualification and recommending a GFD to medically diagnosed irritable bowel syndrome (p = 0.046). Practitioners with a bachelor degree or higher qualification were more likely to recommend a GFD for NCGS, while practitioners with a bachelor degree or lower were more likely to recommend a GFD for IBS.

Extra-intestinal conditions that CM practitioners recommended a GFD for included skin conditions (60%), children with

Table 1
Descriptive statistics reporting demographic and practice characteristics.

Total N = 145		
	n	%
Gender		
Male	11	7.6
Female	134	92.4%
State/Territory		
NSW	43	29.8
Victoria	44	30.5
Qld	38	26.4
SA	3	2.1
WA	11	7.6
NT	1	0.7
ACT	1	0.7
Tasmania	3	2.1
Age range		
20–29	11	7.6
30–39	26	17.9
40–49	49	33.8
50–59	42	29
60–69	13	9
70–79	4	2.7
80+	0	0
Qualification	n	%
Certificate IV	2	1.4
Diploma	6	4.1
Advanced diploma	24	16.5
Bachelor Degree	94	64.8
Graduate certificate	3	2.1
Graduate diploma	7	4.8
Masters Degree	6	4.1
Doctor of Philosophy	3	2.1
Years since highest Qualification		
Less than 5 years	53	36.5
5–9 years	31	21.9
10–14 years	28	19.3
15–19 years	12	8.3
Years in clinical practice		
Less than 5 years	50	34.5
5–9 years	33	57.2
10–14 years	25	17.2
15–19 years	15	10.3
20 or more years	22	15.2

developmental disorders (53%), mental health conditions (46%), weight management (39%) and neurological conditions (33%). A summary of all extra-intestinal conditions a GFD was recommended for can be seen in Table 3.

Significant medium associations were found between level of qualification and CM practitioners who prescribed a GFD diet for

skin conditions ($p = 0.036$) and weight management ($p = 0.09$). Practitioners who had a bachelor degree or higher were more likely to recommend a GFD for skin conditions or for weight management than those with a lower qualification. Similarly, a significant medium association was found between length of time in practice and prescription of a GFD for auto-immune disease ($p = 0.025$); the longer the practitioner was in practice the more likely they were to recommend a GFD for auto-immune diseases (See Table 3).

3.3. Patient communication with CMPs about GFDs

When practitioners were asked if patients enquired about a GFD they reported that the majority of patients wanted to know their opinion on the benefits of a GFD ($n = 110, 78\%$). A greater number of patients were found to be following a GFD prior to consulting a CMP ($n = 82: 57.7\%$) compared to those who were not ($n = 60: 42.3\%$; see Table 4)

No statistical difference was found between people who have been medically diagnosed with CD and patients who ask CM practitioners opinion on the benefits of GF diet ($p = 0.51$). Likewise, no statistical difference was found with CM practitioners who personally follow a GF diet and patients asking them about the benefits of a GFD ($p = 0.81$), or between CM practitioners who refer to medical practitioners or specialists and how often people ask for their opinion on the benefits of a GFD ($p = 0.855$).

4. Discussion

The aim of this study was to describe for what health conditions Australian naturopaths, Western herbalists and nutritionists (non-dietetic) recommend a gluten free diet. This study found that the range of conditions, including extra-intestinal conditions, for which CMPs recommend GFDs is diverse. The extent of therapeutic benefit obtained from such recommendations is unknown, which is an important area for future research.

GFDs are essential for patients with coeliac disease, gluten ataxia, dermatitis herpetiformis and wheat allergy, and provide relief for those with NCGS [8–10]. However, this study has revealed that CMPs are recommending GFDs for a much broader range of health conditions. In addition to the conditions with a medical indication for a GFD, CMPs recommend a GFD to people living with inflammatory bowel disease, irritable bowel syndrome, non-specific gastrointestinal symptoms such as bloating and flatulence, people with chronic constipation, and a number of extra-intestinal conditions. The published evidence to support such a recommendation currently is lacking.

Table 2

Chi square and Cramers' V analysis between frequency of recommendations for gluten free diets for gastrointestinal conditions and age, years in practice and level of qualification.

Gastrointestinal condition	n (%)	Age		Years on Practice		Level of Qualification	
		Chi Sq	p value	Chi Sq	p value	Chi Sq	p value
Coeliac disease	138 (95.2)	0.240	0.215	0.058	0.250	0.472	0.213
Non-coeliac gluten sensitivity (NCGS)	129 (99)	0.357	0.195	0.013	0.294	0.001	0.414
Inflammatory bowel disease	106 (73.1)	0.735	0.138	0.378	0.170	0.443	0.217
Irritable bowel syndrome	87 (60)	0.916	0.1009	0.221	0.198	0.046	0.314
Non-specific gastrointestinal symptoms such as bloating and flatulence	76 (52.4)	0.363	0.193	0.605	0.137	0.243	0.251
Other reasons	58 (40)	0.982	0.0701	0.458	0.158	0.410	0.222
Chronic constipation	58 (40)	0.055	0.273	0.682	0.125	0.137	0.275
Diarrhoea	51 (35.2)	0.131	0.242	0.970	0.060	0.092	0.290
Cancer of the gastrointestinal tract	48 (33.1)	0.178	0.229	0.355	0.174	0.454	0.216
Gastroesophageal reflux disease	45 (31.3)	0.075	0.262	0.307	0.182	0.137	0.275
Functional dyspepsia	43 (29.7)	0.451	0.180	0.742	0.116	0.541	0.203
Gastric or duodenal ulcers	35 (24.1)	0.157	0.234	0.850	0.097	0.741	0.172

Table 3
Chi Square and Cramers' V analysis between Frequency of recommendations for gluten free diets for extra-intestinal conditions and age, years in practice and level of qualification.

Extra-Intestinal Conditions	n (%)	Age		Years in Practice		Level of Qualification		
		Chi Sq	p value	Cramers' V	Chi Sq	p value	Cramers' V	Chi Sq
Skin conditions	87 (60)	0.770	0.132	0.423	0.163	0.036	0.322	
Children with developmental disorders	77 (53.1)	0.517	0.178	0.346	0.175	0.352	0.231	
Mental health conditions	67 (46.2)	0.716	0.141	0.226	0.197	0.098	0.288	
Weight management	57 (39.3)	0.746	0.136	0.360	0.173	0.009	0.358	
Neurological conditions	48 (33.1)	0.980	0.071	0.738	0.117	0.615	0.192	
Female reproductive disorders	38 (26.2)	0.474	0.177	0.251	0.192	0.453	0.216	
Other conditions	37 (25.5)	0.145	0.238	0.027	0.274	0.211	0.257	
Musculoskeletal conditions	36 (24.8)	0.800	0.127	0.358	0.173	0.321	0.236	
Respiratory conditions	34 (23.4)	0.158	0.234	0.211	0.200	0.151	0.272	
Infertility	34 (23.4)	0.102	0.251	0.164	0.211	0.157	0.270	
General wellbeing	32 (22)	0.389	0.189	0.112	0.227	0.121	0.280	
None of the above	17 (11.7)	0.565	0.163	0.129	0.221	0.038	0.320	
Cardiovascular disease	16 (11)	0.121	0.245	0.638	0.132	0.406	0.223	

Table 4
Patient asking CM Practitioners for their opinion of a GFD and how often they are already following a GFD before consulting a CM practitioner.

Response	Ask for Opinion of benefits of a GFD		Already following a GFD	
	Frequency	Percentage	Frequency	Percentage
Very often	22	15.6%	8	5.6%
Often	50	35.46%	34	23.9%
Sometimes	38	36.9%	40	28.2%
None	16	11.3%	36	25.3%
Rarely	10	7.1%	19	13.4%
Very rarely	5	3.5%	5	3.5%

The results of this investigation are valuable for a number of reasons. First, given the broader clinical application, it could be implied that GFDs are playing a therapeutic role in the management of a number of conditions other than those with established evidence for dietary exclusion of gluten. These recommendations from qualified practitioners are likely to occur if both practitioner and their patients are observing some therapeutic gain. Therefore, this opens up an opportunity for future research to conduct clinical trials or observation studies to confirm or deny this benefit. Consequently, this study has also identified a need for research that evaluates the therapeutic outcomes of GFDs across a broader range of health conditions. Especially those conditions or symptoms that CMPs are most commonly recommending GFDs for including; inflammatory bowel disease, bloating and flatulence, irritable bowel syndrome, chronic constipation, skin conditions, and children with developmental disorders.

A recent study on NCGS investigated a new theory on possible pathogenic mechanisms [14]. This study considered that NCGS was a multi-factor-onset disorder, which can be potentially transient and preventable without a specific genetic pattern. There is a possibility of an epigenetic component which can be strongly related to diet and the microbiota. Therefore, dietary choices, dysbiosis, short chain fatty acid production and possibility intestinal permeability may all be involved with NCGS [14].

A critical point that cannot be ignored here is the potential that any benefits obtained from a GFD for symptoms or conditions, are not in fact associated with an established gluten related disorder and may be related to intolerance to fermentable carbohydrates. The removal of gluten from the diet may be inadvertently be treating an undiagnosed gluten related disorder or carbohydrate intolerance. It is important that any common co-morbidity or symptoms of a gluten related disorder is fully investigated consistent with established evidence-based clinical guidelines [15]. In addition, symptoms of bloating, flatulence and irritable

bowel syndrome have been associated with an intolerance to short-chain carbohydrates [16]. Patients with an intolerance to short chain carbohydrates including fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAPs) respond to excluding FODMAP containing foods; excluding FODMAP containing foods does not necessitate an exclusion of all gluten containing grains, only wheat [17]. Whilst long term exclusion of FODMAP containing foods has been associated with alterations in the microbiome, the consequences of these changes are still being elucidated. There are implications for dietary exclusion of gluten; for example, nutritional deficiencies have been identified in people with CD who adhered to a GFD; however, this is likely to be related to inadequate dietary choices and/or poor recovery of the absorptive surface of the small intestine [18].

Overall, this study raises more questions than it answers, and reveals numerous areas for further research. It is important to note that the findings of this study are limited by the sample size (n=145) and potentially by the selection of practitioners registered with PRACI or the professional organisations. Furthermore, whilst the range of conditions for which a GFD was recommended was broad, no insights as to the basis of GFD use for these other conditions was either requested or provided. Consequently, as mentioned, there is no evidence to date to demonstrate whether the broader recommendation of a GFD is a fad or in fact an important dietary intervention for a number of conditions other than those with a known medical indication. Further research to investigate the effects of such recommendations is required.

5. Conclusion

This study has identified that CMPs are recommending a GFD for a broad number of health conditions in addition to those with a medical indication for this dietary restriction; including inflammatory bowel disease, irritable bowel syndrome, non-specific gastrointestinal symptoms (e.g. bloating and flatulence), chronic constipation and various extra-intestinal conditions. There is currently no strong evidence to support the benefits of a GFD for these; thus providing opportunities for future research. Future research is also needed to determine the reasons why CMPs recommend GFDs in conditions for which it is not indicated.

Ethical approval

Ethical approval for the study was provided by The Human Research Ethics Committee of the University of Sydney (HREC-approval number 2017/139), and the PRACI steering committee

approved the use of the PRACI database for recruitment (PRACI approval number 20170110).

References

- [1] A.M.C. Barca, M.E. Mejía-León, Are gluten-free foods just for patients with a gluten-related disease? in: L. Rodrigo (Ed.), *Celiac Disease and Non-Celiac Gluten Sensitivity*, InTech, Rijeka, 2017 Ch. 05.
- [2] K. Nunes, *Beyond the Peak: What's Next for Gluten-Free Foods?* Food Business News, 2016 [cited 2017].
- [3] A. Sapone, et al., Spectrum of gluten-related disorders: consensus on new nomenclature and classification, *BMC Med.* 10 (1) (2012) 13.
- [4] S. Krishnareddy, S. Lewis, P. Green, Dermatitis herpetiformis: clinical presentations are independent of manifestations of celiac disease, *Am. J. Clin. Dermatol.* 15 (1) (2014) 51–56.
- [5] R.P. Anderson, et al., A novel serogenetic approach determines the community prevalence of celiac disease and informs improved diagnostic pathways, *BMC Med.* 11 (1) (2013) 188.
- [6] R.P. Anderson, Coeliac disease is on the rise, *Med. J. Aust.* 194 (6) (2011) 278–279.
- [7] A. Rubio-Tapia, et al., Increased prevalence and mortality in undiagnosed celiac disease, *Gastroenterology* 137 (2009).
- [8] P. Green, B. Jabri, Celiac disease, *Annu. Rev. Med.* 57 (2006) 207–221.
- [9] C. Catassi, et al., Non-celiac gluten sensitivity: the new frontier of gluten related disorders, *Nutrients* 5 (10) (2013) 3839.
- [10] G. Czaja-Bulsa, Non coeliac gluten sensitivity—a new disease with gluten intolerance, *Clin. Nutr.* 34 (2) (2015) 189–194.
- [11] J.R. Biesiekierski, et al., Characterization of adults with a self-diagnosis of nonceliac gluten sensitivity, *Nutr. Clin. Pract.* 29 (4) (2014) 504–509.
- [12] R. De Giorgio, U. Volta, P.R. Gibson, Sensitivity to wheat, gluten and FODMAPs in IBS: facts or fiction? *Gut* 65 (1) (2016) 169–178.
- [13] S. Golley, N. Corsini, D. Topping, et al., Motivations for avoiding wheat consumption in Australia: results from a population survey, *Public Health Nutr.* 18 (3) (2015) 490–499.
- [14] M.M. Walker, J.F. Ludvigsson, D.S. Sanders, Coeliac disease: review of diagnosis and management, *Med. J. Aust.* 207 (4) (2017) 173–178.
- [15] V. Leccioli, M. Oliveri, M. Romeo, et al., A new proposal for the pathogenic mechanism of non-coeliac/non-allergic gluten/wheat sensitivity: piecing together the puzzle of recent scientific evidence, *Nutrients* 9 (11) (2017) 1203.
- [16] S.J. Shepherd, et al., Dietary triggers of abdominal symptoms in patients with irritable bowel syndrome: randomized placebo-controlled evidence, *Clin. Gastroenterol. Hepatol.* 6 (7) (2008) 765–771.
- [17] A. Lowe, R. Moseley, Role of dietary FODMAPs in IBS-related symptoms, *Gastroenterology* 146 (1) (2014) 1.
- [18] S.J. Shepherd, P.R. Gibson, Nutritional inadequacies of the gluten-free diet in both recently-diagnosed and long-term patients with coeliac disease, *J. Hum. Nutr. Diet* 26 (4) (2013) 349–358.