Monitoring/Evaluation in Nutritional Therapy for People with Gastrointestinal Complaints: Online Survey with Dietitians

Monitoring/Evaluation in der Ernährungstherapie bei Menschen mit Gastrointestinalen Beschwerden: Online-Erhebung unter Ernährungsberater*innen

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Authors
Eveline Zbären[1], Srividhya Padmanabhan[2], Sandra Jent[1]

Affiliations
1 Nutrition & Dietetics, Bern University of Applied Sciences, Bern, Switzerland
2 Department of Mathematics, Seminar for Statistics, ETH Zürich, Zurich, Switzerland

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Georg Thieme Verlag, Rüdigerstraße 14,
70469 Stuttgart, Germany

Correspondence
Sandra Jent
Bern University of Applied Sciences, Nutrition & Dietetics,
Murtenstrasse 10
3008 Bern
Switzerland
Tel.: +41 31 848 37 84
sandra.jent@bfh.ch

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ABSTRACT

Introduction Dietary interventions are part of the therapy approach in gastrointestinal disorders. However, guidance on what outcomes to assess (in the form of a core outcome set) for dietitians to demonstrate the effectiveness of their interventions is lacking. This study provides preliminary work for the development of a core outcome set to systematically assess outcomes of nutrition therapy in clients with gastrointestinal complaints by examining how monitoring/evaluation are conducted by dietitians.

Methods This is a quantitative online survey for dietitians to assess the current situation around the globe concerning monitoring and evaluation. An online survey with 26 questions divided into six sections (rated importance, implementation, resources/obstacles, instrument requirements, statistical questions and experiences with the Nutrition Care Process) was developed. The questionnaire was available in English, French and German.

Results In total 740 responses were analysed. Monitoring/evaluation of clients with gastrointestinal symptoms was rated by 98 % to be quite important to very important. The systematic implementation of monitoring and evaluation according to a concept/model was rated by 57 % as 'rather often' to 'very often/always'.

Conclusion Dietitians are aware of the importance of the measurability of dietetic interventions. The most dominant barriers are lacking time in daily practice and lack of a suitable monitoring/evaluation instrument. A suitable core outcome set in the field of gastrointestinal complaints is needed to increase systematic monitoring/evaluation.

ZUSAMMENFASSUNG

Einleitung Diätetische Interventionen sind Teil des Therapieansatzes bei gastrointestinalen Beschwerden. Es fehlt jedoch eine Anleitung für Ernährungsberater*innen welche Ergebnisse/Outcomes (in Form eines Core Outcome Sets) zu bewerten sind, damit die Wirksamkeit ihrer ernährungstherapeutischen Interventionen nachweisbar sind. Diese Studie stellt die Vorarbeit für die Entwicklung eines Core Outcome Sets dar,

zur systematischen Erfassung von ernährungstherapeutischen Outcomes bei Klienten mit gastrointestinalen Beschwerden. Die Durchführung von Monitoring/Evaluation durch die Ernährungsberater*innen wird untersucht.

Methoden Es handelt sich um eine quantitative, weltweit durchgeführte Online-Erhebung unter Ernährungsberater*innen, zur Bewertung der aktuellen Situation in Bezug auf Monitoring und Evaluation. Es wurde ein Online-Erhebung mit 26 Fragen entwickelt, unterteilt in sechs Bereiche (bewertete Wichtigkeit, Durchführung, Ressourcen/Hindernisse, Anforderungen an ein Instrument, statistische Fragen und Nutrition Care Process Erfahrungen). Der Fragebogen stand in Englisch, Französich und Deutsch zur Verfügung.

Ergebnisse Insgesamt wurden 740 Antworten ausgewertet. Monitoring/Evaluation in der Beratung von Klienten mit gastrointestinalen Symptomen wurde von 98 % als ziemlich wichtig bis sehr wichtig eingestuft. Die systematische Durchführung von Monitoring und Evaluation anhand Konzepten/Modellen wurde von 57 % als 'eher oft' bis 'sehr oft/immer' bewertet.

Schlussfolgerung Ernährungsberater*innen sind sich der Wichtigkeit der Messbarkeit von diätetischen Interventionen bewusst. Die größten Hindernisse ist der Zeitmangel in der täglichen Praxis und das Fehlen eines geeigneten Instruments zur Durchführung von Monitoring/Evaluation. Um das systematische Monitoring/Evaluation zu fördern, wird ein geeignetes Core Outcome Set im Bereich der gastrointestinalen Beschwerden benötigt.

Introduction

Healthcare in general, but also nutritional therapy, face the challenge of demonstrating that therapies are effective. This is often done through secondary data analysis such as the retrospective analysis of health records [1]. However, if such studies are not well designed before data collection, problems arise such as heterogeneous and missing data, which sometimes make it impossible to draw conclusions about efficacy [2]. The importance of outcome assessment has been highlighted by several authors and has become increasingly required in healthcare [2, 3]. The profession of dietitians experiences less appreciation in countries where dietitians hardly generate data to demonstrate the importance and the effectiveness of nutritional therapy. Thus, the systematic collection of outcome data strengthens the dietetic profession [2].

Dietitians make use of standardized process models and standardized nutrition and dietetics terminology. Dietetic process models, like the Nutrition Care Process (NCP) include a process step called nutrition monitoring/evaluation [2, 4] or monitoring and review aiming at 'demonstrating the amount of progress made' [4]. The Nutrition Care Process Terminology (NCPT) and the International Classification of Functioning, Disability and Health-Dietetics (ICF-Dietetics) [5] are the two main standardized terminologies used in dietetics. Whereas the NCPT is used in a range of countries internationally [6], ICF-Dietetics is mainly used by dietitians from Austria, Belgium and the Netherlands [7].

In addition, some process models contain an outcome assessment on a macro-level such as the 'Outcomes Management System' in the German-Nutrition Care Process (G-NCP) [8]. This macro-level evaluation allows evaluating the outcomes of dietetic practice by using aggregated data on an institutional, regional or inter-regional level [2]. The use of dietetic process models and outcome-related steps has already resulted in a range of studies assessing the effectiveness of dietetic practice [4, 9, 10]. Such studies, however, show certain limitations. Dietetic process models assume that outcomes are individually selected in nutritional therapy. This is undoubtedly important in nutritional therapy, but it may also contribute to the mentioned heterogeneous data, thus complicating data aggregation. This was, for example, shown by the Australian study of Hickman et al. [9] where dietetic relevant outcomes were recorded. They concluded that they were unable to assess the effectiveness of the collected data because of their heterogeneity and the presence of confounding factors in them. Thus, additional work on outcomes assessment and potential thoughts about a more systematic way of assessing outcomes are required while keeping the process as individualistic as possible. Some authors have suggested specified sets of outcomes to resolve these issues. Such outcome sets should be developed in a disease-specific way with consensus methods to increase the quality of the outcomes assessed and facilitate data aggregation [11], as in Core Sets of the WHO International Classification of Functioning, Disability and Health (ICF) [12, 13]. Evidence on current monitoring and evaluation (M&E) practice in dietetics is scarce, but according to the International NCP/NCPT Implementation Survey, M&E is the process step of the NCP implemented least frequently [6]. Dietary interventions are part of the therapy approach in gastrointestinal disorders. Our research group plans to develop a core outcome set to systematically assess outcomes of nutrition therapy in clients specifically with gastrointestinal complaints in everyday nutritional therapy. We need to better understand the current M&E practice in this field to develop such a set of outcomes that applies to dietitians in their daily practice. Thus, we carried out an international survey of the current dietetic M&E practice in clients with gastrointestinal complaints with the help of an online questionnaire assessing current practices, resources and obstacles.

Methods

Study design and participants

A quantitative, online survey was conducted internationally between November and December 2019 to assess the dietetic practice of M&E in gastrointestinal cases.

The target group of the online survey were legally recognized dietitians (registered/accredited dietitians or an equivalent professional title where registration is not obligatory) at least 18 years old who counselled at least one client with gastrointestinal complaints in a clinical or outpatient setting in the previous 12 months. Gastrointestinal complaints were defined as irritable bowel syndrome

(or suspected), leaky gut syndrome (permeable bowel syndrome), Crohn's disease, ulcerative colitis, food intolerances, lactose intolerance, fructose malabsorption, histamine intolerance, coeliac disease, non-coeliac gluten sensitivity, diarrhoea, and constipation. But the definition excludes food allergies, liver and pancreatic diseases or post-bariatric surgery interventions as the assessed outcomes might have significant overlap between the first-mentioned conditions but less between the latter ones.

The ethics committee of Bern declared that the project did not require approval according to the Swiss Human Research Act, Art. 2, Para. 1 (Req-2019–00483).

All the 45 member-organisations of the 'International Confederation of Dietetic Associations' (ICDA), the 'European Federation of Associations of Dietitians' (EFAD) and seven universities with dietetic programs were asked to forward the link to the M&E survey to their members (universities to their alumni) by e-mail, newsletter, or social media. After two weeks, a reminder was sent. In addition, the authors published the M&E survey link via social media.

Survey development and data collection

As no suitable questionnaire existed, the survey questionnaire (Suppl. 1) was developed in a multi-stage procedure using the process of operationalization (determining the suitable research method and determining the variables of interest) [14, 15]. Based on the process of operationalization the first author conducted explorative interviews with expert dietitians up to the point in time when no further relevant areas have been identified through further interviews (n = 13) [16] and clustered the answers to determine the most critical areas within M&E. This first data formed the basis for the development of a questionnaire. Nine expert dietitians' were from Switzerland (n = 7 without professional experience abroad, n = 2 with professional experience in Switzerland and England). Four expert dietitians' working outside of Switzerland participated as well - England (n = 2), Ecuador (n = 1) and Canada (n = 1). The expert dietitians indicated gastroenterology as their major area of practice. They had 3 to 40 years (mean 16 years) of professional experience and conducted a mean of 46 functional gastrointestinal disorder consultations per month.

The answers of the expert dietitians were entered through keyword notes into a semi-structured interview guide. The clustered evaluation of the expert interviews gave a first overview of possible questionnaire areas and a basis for literature research and resulted in the creation of the first draft of the questionnaire.

The capability, opportunity, and motivation 'behaviour-system' (COM-B) was used for clustering response options obtained in the expert dietitians' interviews. COM-B is a behaviour system where the capability (knowledge, skills), opportunity (external factors) and motivation (goals, brain processes that stimulate behaviour) in an individual are interacting with each other in generating behaviour [17]. In the questionnaire development, it was mainly used to develop the questions about resources and obstacles in M&E.

The questionnaire was developed in German and contained 26 questions divided into six sections (importance of M&E, implementation of M&E, resources and obstacles during M&E, requirements for a systematic outcome assessment instrument, statistical questions to assess characteristics of the participants and experiences with the NCP). The 26 questions included three open-ended questions (question number 17,21,23), 14 semi-open-ended questions (question number 5–12, 14–16, 18–20), eight closed-ended questions (question number 1–4, 22, 24–26) and one optional question (question number 13). Three six-point Likert scales were used (1 = never/very rare; completely unimportant; not applicable at all to 6 = very often/always; very important; fully applicable). The additional answer choice 'I don't know' was used for most questions to differentiate between the scale rating and not knowing about it. Informed consent had been obtained from the participants before the questionnaire started. Control questions were asked at the end of the M&E survey to ensure that participants fulfilled the inclusion criteria.

The German questionnaire version was pre-tested by two Swiss dietitians focussing on comprehensibility. After adjustments, the final German questionnaire was then translated to French and English by a professional interpreter who is proficient in German, French and English. The back-translation of the French and English questionnaire versions to German was conducted individually by two bilingual persons from the field of dietetics and one from the IT sector. The French and English questionnaires were also pre-tested by two native speakers for comprehensibility and congruence between the languages [16, 18] (including native-speaking dietitians and native speakers with different professional backgrounds).

The survey was conducted anonymously using an online tool (Smart Survey, UK). The English, German, and French versions were open from the 17th of November, 20th of November, and 29th of November 2019. All three surveys were closed on the 22nd of December 2019.

Statistical analysis

Participants not meeting the inclusion criteria and with incomplete questionnaire sets were excluded from the data set. The first author exported the data from the online tool to an Excel sheet and did the coding before importing it to R. A statistician advised the first author on statistical evaluations. Descriptive statistics were used to describe the main results. Data are presented in relative frequencies throughout the paper. Independent groups were compared using the Wilcoxon rank-sum test with continuity correction. P-values were adjusted for multiplicity, and the level of significance was established at 0.05 [18]. Only complete responses to the mandatory questions were included in the analysis (n = 740). Nevertheless, a few questions were optional. The answers to the 'free text field' questions were used to form new categories (inductive coding) [19].

Results

Twenty-nine ICDA members, EFAD (via EFAD newsletter) and seven universities with dietetic programs shared the link to their members or their alumni (organisations are listed in the acknowledgements).

The participant characteristics are listed in ▶ **Tab. 1**. In total, 740 completed responses of registered dietitians from all continents and 43 countries (▶ **Tab. 2**) were statistically analysed. Incomplete questionnaire sets (n = 593) and responses not meeting the inclusion criteria (n = 10) were excluded. One response did not meet the

▶ **Tab. 1** Participant characteristics in absolute and relative frequencies (n = 740)

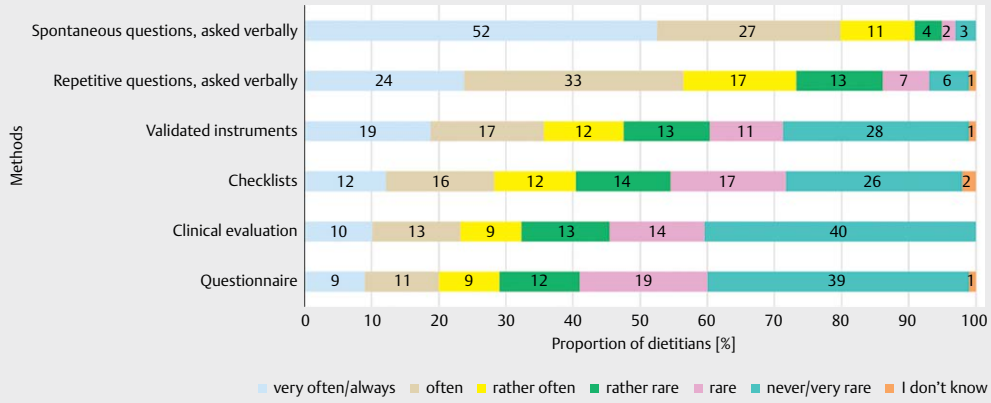
General characteristics	
Gender, female, n (%)	702 (94.9%)
Mean age, years, (± SD)	38.3 (11.2)
Participants divided according to age group, years, n (%)	
18–23	17 (2.3%)
24–29	185 (25%)
30–35	165 (22.3%)
36–40	98 (13.2%)
41–45	67 (9.1%)
46–50	75 (10.1%)
51–55	66 (8.9%)
56–60	39 (5.3%)
61–65	22 (3%)
66–70	6 (0.8%)
Professional experience, years, n (%)	
0–5	257 (35%)
More than 5–10	167 (23%)
More than 10–15	95 (13%)
More than 15–20	74 (10%)
More than21	140 (19%)
Average advised people with gastrointestinal symptoms* /year, n (%)	
1–9	89 (12%)
10–49	303 (41%)
50–89	166 (22%)
90–129	80 (11%)
130–169	45 (6%)
170 or over	57 (8%)

*Included gastrointestinal symptoms: Irritable bowel syndrome (or suspected), leaky gut syndrome (permeable bowel syndrome), Crohn's disease, ulcerative colitis, food intolerances, lactose intolerance, fructose malabsorption, histamine intolerance, coeliac disease, non-coeliac gluten sensitivity, diarrhoea and constipation. Excluded: Food allergies, liver and pancreatic diseases, and bariatric surgery

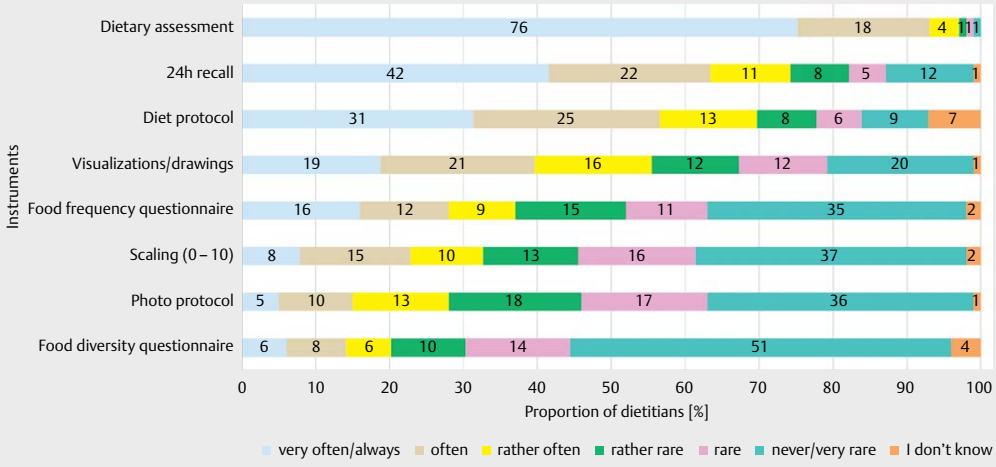
consent criterion; three were rejected because of not meeting the job requirement, and six were excluded because of underage (< 18 years of age). Some of the respondents were quite young for being registered dietitians. Therefore, the youngest age group (18–23 years) was looked at separately. These dietitians come from Austria (n = 5), Belgium/France/Germany (each n = 2) and Greece/Hungary/India/South Africa/Switzerland/Colombia (each n = 1) and the following job titles were mentioned: Diätolog(e)/in (n = 6), Registered/Accredited practising Dietitian (n = 5), BSc in Ernährung und Diätetik/dipl. Ernährungsberater/in (n = 4), Diätassistent/in (n = 1) and Lecturer/Professor (n = 1) (Question 19).

▶ **Tab. 2** Number of participants per continent in absolute and relative frequencies (n = 740)

Continent	n (%)
Country	
Europe	482 (65.1%)
Switzerland	160 (21.6%)
Germany	101 (13.7%)
Austria	77 (10.4%)
United Kingdom	28 (3.8%)
France	25 (3.4%)
Finland	18 (2.4%)
Portugal	17 (2.3%)
Belgium	10 (1.4%)
Netherlands	8 (1.1%)
Greece, Luxembourg, Norway	7 (1%) each
Turkey	6 (0.8%)
Hungary	5 (0.7%)
Sweden	4 (0.5%)
Ireland, Spain	2 (0.3%)
Cyprus, Denmark, Italy, Macedonia	1 (0.1%) each
North America	98 (13.2%)
Canada	72 (9.7%)
United States	17 (2.3%)
Caribbean	6 (0.8%)
Mexico	2 (0.3%)
Costa Rica	1 (0.1%)
Australia / Oceania	57 (7.7%)
Australia	44 (6%)
New Zealand	13 (1.8%)
Asia	51 (6.9%)
Pakistan	20 (2.7%)
Malaysia	7 (1%)
Singapore	6 (0.8%)
Israel	5 (0.7%)
India	3 (0.4%)
Iran, Lebanon, Qatar	1 (0.1%) each
Africa	40 (5.4%)
South Africa	24 (3.2%)
Nigeria	11 (1.5%)
Benin	3 (0.4%)
Namibia	2 (0.3%)
South America	11 (1.5%)
Argentina	7 (1%)
Brazil	3 (0.4%)
Colombia	1 (0.1%)
NA	1 (0.1%)



▶ **Fig. 1** Methods to conduct monitoring and evaluation with corresponding relative frequencies of dietitians (n = 740) (Question 5).



▶ **Fig. 2** Used instruments to assess dietary behaviour in relative frequencies (n = 740) (Question 9).

Importance of monitoring and evaluation and its implementation

The importance of M&E of clients with gastrointestinal symptoms (Question 2) was rated by 98 % of the dietitians as 'quite important' to 'very important'. Seventy-nine per cent of the dietitians considered it 'important' to develop a validated instrument for the systematic M&E of clients with gastrointestinal symptoms (Question 3).

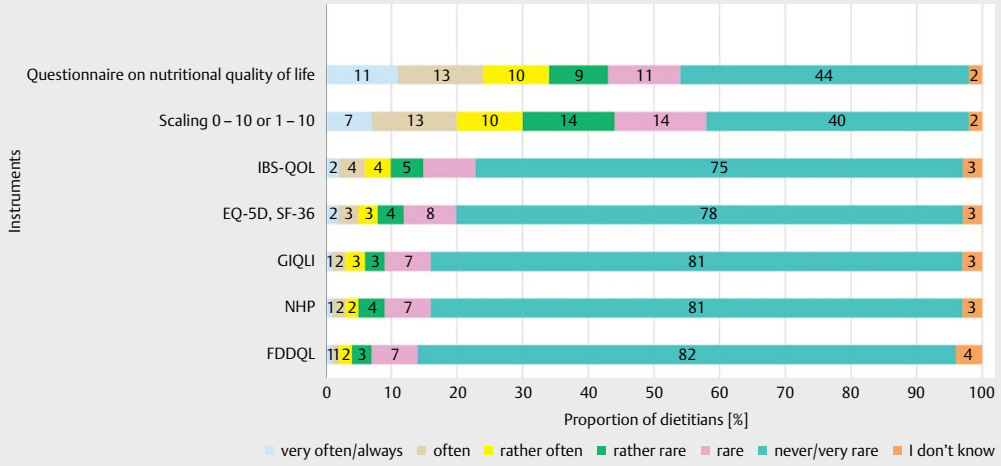
A little more than half of the dietitians (57 %) stated that they did M&E based on a concept/model 'rather often' to 'very often/always' (Question 4).

Respondents were also asked at what time points they assessed outcome indicators (Question 14). The two most common time points were 'in the follow-up consultations' (92 % 'rather often to very often/always') and 'during the first consultation' (90 %). The other time points assessed were 'between the consultations' (48 %), 'after the last consultation' (46 %) and assessing outcome indicators 'before the first consultation' (43 %)[1] takes place, all of which were significantly less frequently used ($p < 0.001$).

When asked about methods generally applied in M&E in the nutritional consultations (Question 5) (▶ **Fig. 1**), 'spontaneous questions, asked verbally' were carried out most often (79 % rated between 'often' to 'very often/always') and significantly more often than all the other methods (mean (SD) 5.1 (1.2), $p < 0.001$). The only other method regularly carried out ('often' to 'very often/always') by more than half of the dietitians was 'repetitive questions, asked verbally' (57 %).

The questionnaire also assessed how the dietitians assessed outcomes in specific domains: Symptoms (Question 7), stool consistency/stool frequency (Question 8), eating behaviour (Question 9), state of health (Question 10), quality of life/environment/social issues (Question 11) and laboratory parameters (Question 12).

[1] Explanation of 'before the first consultation': Before the first consultation takes place means, for example, a survey to assess indicators/the actual situation immediately before the first consultation, e. g. through a questionnaire.



▶ **Fig. 3** Used instruments to measure the quality of life/environment/social issues in relative frequencies (n = 740). IBS-QOL = Irritable bowel syndrome quality of life questionnaire; EQ-5D/SF-36 = Questionnaire on general health-related quality of life; GIQLI = Gastrointestinal quality of life index; NHP = Nottingham health profile questionnaire on general health-related quality of life; FDDQL = Functional digestive disorders quality of life questionnaire (Question 11).

When asked about methods to assess these specific areas of outcomes, the dietitian named methods to assess dietary behaviour/eating behaviour (Question 9) more often than those to assess the state of health (Question 10), quality of life, environment, social issues (Question 11) or instruments specific to measure symptoms (Question 7). Of the methods to assess eating habits (▶ **Fig. 2**) (Question 9), the 'dietary assessment' was the method used significantly most common (94 % 'often' to 'very often/always') ($p < 0.001$). Other methods applied by more than half of the dietitians were '24 h recall' (75 %) and 'diet protocols' (69 %). On the other hand, 'food diversity questionnaires' were the method used least often with 14 % of the dietitians using it 'often' to 'very often/always'.

In the domain of gastrointestinal complaints, dietitians indicated to regularly use 'checklist' to assess symptoms (57 %) (Question 7) and scaling (0–10 or 1–10) for measuring symptoms (47 %) (Question 7), ('rather often' to 'very often/always'), but to only rarely use visualizations/own representations/drawings (25 %) and the Gastrointestinal Symptom Rating Scale (GSRS) (10 %) ('rather often' to 'very often/always') to measure symptoms (Question 7). According to the dietitians, the stool consistency and stool frequency were assessed regularly, usually by using the Bristol Stool Chart (49 % 'rather often' to 'very often/always') (Question 8). In contrast, visualizations/own representations/drawings were used rarely (31 %, 'rather often' to 'very often/always') (Question 8).

Measuring the state of health by 'scaling (1–10 or 0–10)' (32 %) or through 'visualizations/own representations/drawings' (23 %) is ('rather often' to 'very often/always') used. (Question 10)

Although the dietitians indicated using a 'questionnaire on the nutritional quality of life' (34 %) (Question 11) regularly ('rather often' to 'very often/always'), none of the more specific instruments to measure the quality of life/environment/socials issues, was applied frequently: questionnaire on the nutritional quality of life by (34 %), scaling (0–10 or 1–10) (30 %); irritable bowel syndrome quality of life questionnaire (IBS-QOL) (10 %); questionnaire on general health-related quality of life (EQ-5D, SF-36) (8 %); gastrointestinal quality of life index (GIQLI) (6 %); nottingham health profile questionnaire on general health-related quality of life (NHP) (5 %); functional digestive disorders quality of life questionnaire (FDDQL) (4 %) ('rather often' to 'very often/always') (Question 11) (▶ **Fig. 3**).

Eighty-two percent of the dietitians ('rather often' to 'very often/always') reported using laboratory parameters as a further outcome in dietetic practice (Question 12). When asked which laboratory parameters were used, one-fifth of those dietitians which are using laboratory parameters answered. Most frequently mentioned laboratory parameters were fat-soluble vitamins, water-soluble vitamins, serum-ferritin/iron, haematocrit and haemoglobin.

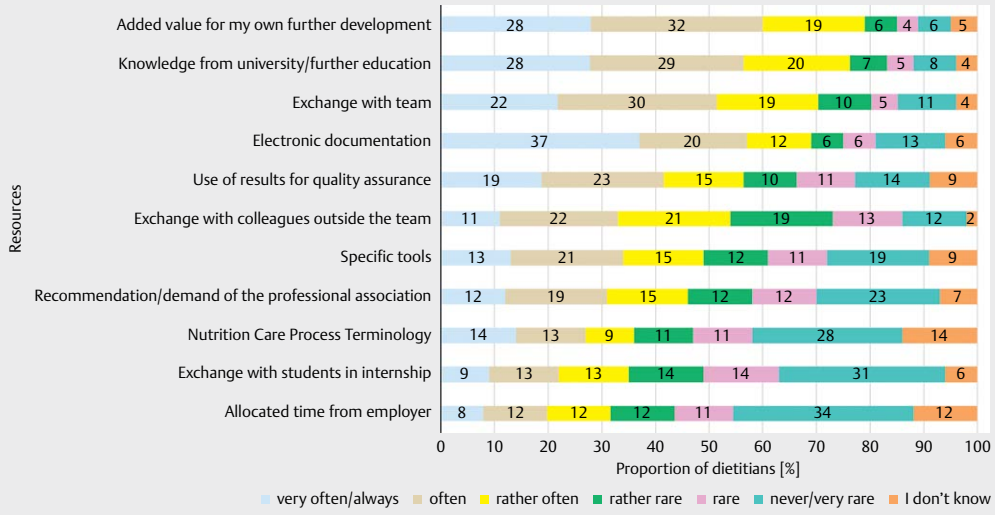
A total of 19 files were shared that are used for M&E (Question 13) (including self-generated questionnaires, checklists and scaling questions) in different languages.

Resources and obstacles

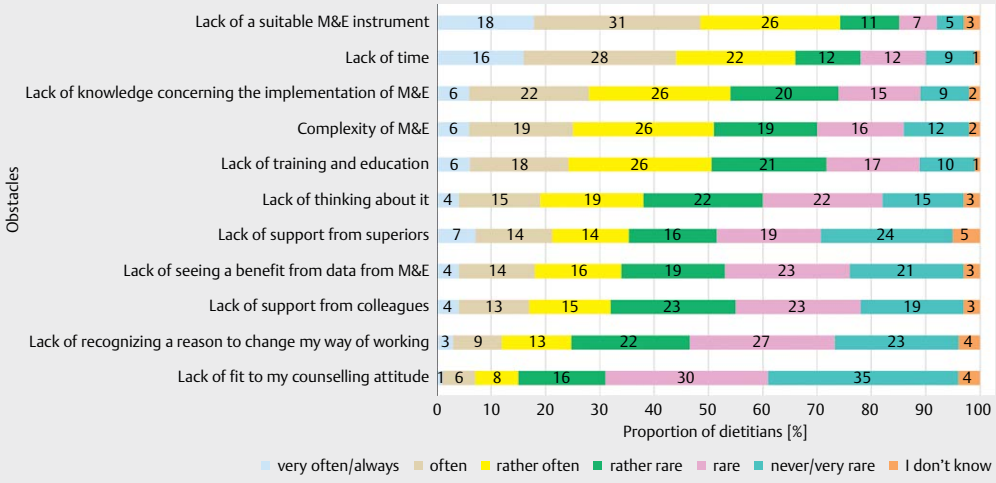
When asked what resources helped them when carrying out M&E (Question 15), 79 % of dietitians rated 'value-addition for their own further development' as 'rather often' to 'very often/always' helpful, 77 % said 'knowledge from university/further education', 71 % mentioned 'exchange with team' and 69 % said 'electronic documentation' (69 %) was most supportive. On the other hand, 'NCP terminology' (36 % 'rather often' to 'very often/always'), 'exchange with students in internship' (35 %) and 'allocated time from employer' (32 %) were regarded as less often helpful in professional practice (▶ **Fig. 4**).

Dietitians were less likely to recognize the NCPT as a resource in daily practice (Question 15) in countries using other process models (Austria: n = 77, 14 % 'rather often' to 'very often/always' helpful, Netherlands: n = 8, 0 %, Belgium: n = 10, 0 %).

There were two obstacles to carrying out M&E in professional practice (Question 16) to which two-thirds or more of the dietitians agreed (rated as 'more or less applicable' to 'fully applicable'): the



▶ **Fig. 4** Resources in professional practice when carrying out monitoring and evaluation in relative frequencies (n = 740) (Question 15).



▶ **Fig. 5** Obstacles in professional practice when carrying out monitoring and evaluation (M&E) in relative frequencies (n = 740).

lack of a suitable M&E instrument (75 %) and the lack of time (66 %) (▶ **Fig. 5**).

Requirements for a systematic outcome assessment instrument

Dietitians indicated that the maximum time allocated for a systematic M&E (Question 17) was 17 minutes on average with 50 % of participants saying they allocated 10 minutes or less.

The M&E tool is desired (Question 18) ('quite important' to 'very important'), in descending order of preferences, to be 'applicable during the consultation' (94 %), 'applicable orally' (in verbal form) (86 %), in 'written form' (86 %), in the 'form of a questionnaire' (76 %), 'available online' (76 %), 'applicable after consultation' (74 %) and 'independently filled in by clients' (70 %). Although M&E during the consultation was significantly more preferred ($p < 0.001$).

Experiences with the Nutrition Care Process

Of the total population surveyed (n = 740), just under 73 % were familiar with the NCP (Question 25). Through a follow-up question, those who were familiar with the NCP (n = 537) were asked how often the NCP is used in professional practice (Question 26). The overall population rated the NCP usage with 72 % as ('rather often' to 'very often always'). Respondents from countries working with other process models than the NCP were less familiar with the NCP (Belgium: n = 10, 10 % familiar with the NCP, Netherlands: n = 8, 13 %; Austria; n = 77, 42 %).

Discussion

This study is the first of its kind to analyse M&E usage in dietetic practice when treating clients with gastrointestinal problems. The study indicates that dietitians consider a systematic outcomes as-

sessment (Question 2) with a validated instrument (Question 3) as highly important, but such tools are not readily available.

In total, 57 % of the dietitians indicated that they had already implemented M&E according to a concept/model (Question 4). The high percentage of dietitians applying a concept/model contradicted somewhat the fact that spontaneous questions, which were asked verbally during the consultation, were reported as by far the most common assessment method (Question 5). One possible explanation could be that some of the dietitians referred to dietetic process models such as the NCP from the Academy of Nutrition and Dietetics, the G-NCP from the Association of German Dietitians, the Diaetological Process from the Austrian Association of Dietitians or the Model and Process for Nutrition and Dietetic Practice of the British Dietetic Association. In an international survey, 58 % of the dietitians reported using NCP monitoring & evaluation frequently or always [6]. Such process models are important frameworks for professional practice. They aim not only to facilitate critical thinking, nutrition care documentation and the application of evidence-based guidelines but also to serve as a common framework for dietetic research [4]. However, the guidance these process models provide for M&E are rather general, promote personalized dietetic care and may contribute to heterogeneous data assessment.

Verbal assessment questions are certainly very important for the consultation process. They are used most often not only according to this study (Question 5) but also according to the study of Cant [10]. However, they are subjective assessment methods as each dietitian asks these questions differently and assesses the answers differently (e. g. open question vs. scales vs. dichotomous). The outcomes, therefore, will not be comparable, thus hampering aggregated outcome research. More standardized instruments such as questionnaires seem to be less applied in dietetics. In the study of Cant [10], questionnaires were very rarely used. The rare use of standardized instruments is also visible in the presented survey (Question 11). Instruments to assess the quality of life such as the Irritable Bowel Syndrome Quality of Life Instrument (IBS-QoL) or the 36-Item Short-Form Health Survey (SF-36) questionnaires are available, but they are not developed for dietitians, nor do they include the different nutrition-specific aspects to conclude which specific parts of nutrition are affecting the quality of life. The potential licensing costs of the instruments to measure the quality of life/environment/social issues (Question 11) could influence the usage frequency.

Instruments are not indicated to be used standardly to measure symptoms or the state of health. Also, the visual analogue scale is not applied frequently. Even though literature describes it as an easy to use tool to make symptoms measurable while simultaneously assessing the client's perspective [20]. Dietitians participating in the present survey prefer to use checklists, which are often self-developed. They are, however, problematic as they do not allow to compare or aggregate data on a national or international level [3] and have not been validated. Another outcome domain dietitians participating in this survey reported using frequently in nutritional therapy are laboratory parameters. This is also supported by the survey of Cant [10] with Australian dietitians (n = 258) in which biological test results are very frequently used for outcome evaluation (99 % rated as 'sometimes to always'). Laboratory parameter, however, have the disadvantage that they are confounded by the therapy of other healthcare professionals [9]. Therefore, also other outcomes need to be assessed to make the effect of nutritional therapy measurable for example eating behaviour which is less influenced by other professions. Further research is needed to determine which outcomes are dietetic specific.

A more structured M&E using validated outcome measurement instruments could solve such issues [11]. One such approach has recently been included in the NCPT with intervention goal and nutrition diagnosis status by the Academy of Nutrition and Dietetics. This allows for comparing nutrition diagnosis resolution rates and, therefore, the effectiveness of nutrition care between different indications as well as intra- and inter-institutionally, nationally and internationally. A first study applying nutrition diagnosis resolution – with resolution states slightly differing from those currently implemented in the NCPT – showed that 59 % of nutrition diagnoses improved or were resolved, and 41 % remained unresolved [21]. Indication-specific validated outcome measurement instruments would represent another important element to enhance M&E in dietetics. How much more could we as dietitians learn about differences in effectiveness and ways to improve nutrition care if all dietitians, for example, assessed gastrointestinal symptoms in one standardized way? How much more credit would our results get in the health sector if we used validated instruments? Until validated instruments are available, other structured assessment methods could be applied, such as the visual analogue scale. The literature describes it as a very helpful and easy tool to make symptoms measurable while simultaneously assessing the client's perspective [20].

A further potential assessment method for nutritional therapy may be the validated scored patient-generated subjective global assessment (PG-SGA) as it may facilitate the quantitative recording of outcome parameters. It is recommended to use in oncology and other catabolic/chronic diseases. This assessment tool can be downloaded free of charge and includes the following assessment categories: weight history, food intake, symptoms, activities and function, disease and relation to nutritional requirements, metabolic demand and physical exam [22]. In literature, PG-SGA is also recommended in combination with body composition measurements to support the detectability of malnutrition and its management in clients with inflammatory bowel disease [23].

In this M&E survey, results demonstrate that lack of time and knowledge and the lack of a suitable M&E instrument are considered formidable obstacles to implementing M&E in practice (Question 16). Lacking time resources is also mentioned as a barrier to NCP implementation [24–26]. Similar findings are described in the literature about barriers and enablers for NCP implementation where the lack of time, training and education are the most often mentioned barriers. On the other hand, regular training sessions are seen as enablers [27]. Therefore, outcome measurement instruments need to be simple, ready-to-use, inexpensive and time-saving to be implemented in everyday practise [28]. Furthermore, outcomes should be assessed directly and independently by the dietitians themselves.

A limitation of this study is that the questionnaire was developed by the authors themselves (not with a validated tool) and was relatively comprehensive. However, it did not assess in detail M&E concepts and models. Furthermore, the data is self-reported, as-

sessed in different languages (heterogeneous population) and may tend to set the individual profession in a good light which could have biased the given responses. The participants were not informed about the minimum age of 18 years as an inclusion criterion before the start of the survey, but six participants were excluded from data analysis because they reported an age below 18 years (Question 23). However, this was somewhat unexpected, as it should hardly be possible to complete education as a dietitian before the age of 18. The number of incomplete questionnaires is high, which may be due to the comprehensive and therefore time-consuming questionnaire. Control questions (Question 20, 22, 23) to verify the inclusion criteria were asked at the end of the survey, to increase the participants' motivation. If they would have been asked in the beginning also the answered questions from the incomplete questionnaire sets could have been included.

Despite the pre-tests involving native speaking dietitians, certain questions were worded somewhat unclear. In question 9 (instruments to measure eating behaviour), the items should have been detailed explained in all three language versions directly below this question in the questionnaire to reduce bias. In the English version, the item 'dietary assessment' could have been replaced by 'diet history' as this is a more specific term that has been defined in the literature [29]. In question 14 (timepoint in dietetic practice process when outcomes/indicators are collected), the answer 'before the first consultation' could have been interpreted differently by the respondents as this response item wasn't explained in the questionnaire.

The question about resources in professional practice (Question 15) and the questions about the experiences with the NCP (Question 25/26) did only relate to the NCP and the NCP Terminology, although some participating countries use different process models and the ICF-Dietetics as standardized language. This may have distorted the answers, especially of the participants not using the NCPT like participants from Austria, Belgium and the Netherlands.

Disease-specific core outcome sets should be based on standardized languages. Currently, there are no dietary specific core outcome sets for gastrointestinal diseases. International cooperation is important as different terminologies exist.

Research about the harmonization of the NCPT and the ICF-Dietetics has shown that most terms of the NCPT (86.5 %) could be connected to the corresponding ICF-Dietetics terminology [7]. The implementation of disease-specific core outcome sets in the health information system is of great advantage in facilitating the routine measurement of the effectiveness of nutrition care. Recently published literature shows the technical implementation feasibility of ICF categories in health information systems [30] and would facilitate automated data collection.

Lastly, a selection bias is probable. Europe was overrepresented when compared with other continents. Likewise, the online survey is not representative of the dietitians from the respective countries. For this reason, no detailed subgroup analyses were carried out. The distribution of the survey link via universities from the USA, Ireland, Switzerland and Austria additionally influenced the number of responses from these specific countries. The survey duration of the three different language versions differed (English version 36 days, German version 33 days, French version 24d) due to unpredictable waiting times in the translation process and represents a further limitation. As the survey was promoted via social media, it remained unclear how many people received the survey link. Thus, no response rate could be calculated. However, we chose this approach to reach a large sample diversity with intercontinental participation [16].

Conclusion

In conclusion, the effectiveness of nutrition care in clients with gastrointestinal complaints is not yet routinely measured. There is a need for dietitians to make the effects of nutritional interventions in the field of gastrointestinal complaints measurable. They are aware of the importance of M&E. Nevertheless, the results demonstrate more coordinated effort is needed to implement M&E. Lacking time in daily practice, lacking knowledge in implementation of M&E and lack of a suitable M&E instrument are dominant barriers to M&E implementation. This indicates the need for a suitable core outcome set in the field of gastrointestinal complaints to increase systematic M&E. More generic outcomes of nutritional therapy, such as the progress evaluation in the NCP, could be integrated in such core outcome sets to facilitate the comparison of the effectiveness of nutritional therapy between different indications. The dietetic profession should collaborate internationally, as different dietetic process models and terminologies exist, and jointly initiate the development of such tools to support each other and further improve the measurability of dietetic interventions. Furthermore, as core outcome sets are new to nutritional practice, implementation outcomes as applicability, appropriateness, costs, feasibility and fidelity should also be researched in the future.

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Die Autorinnen/Autoren geben an, dass kein Interessenkonflikt besteht.

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