



**QUEEN'S
UNIVERSITY
BELFAST**

Training 1,200 dietitians: An evaluation of a training course for non-specialist dietitians on the management of pancreatic exocrine insufficiency

Phillips, M. E., McGeeney, L. M., Griffin, O., Freeman, K., Dann, S., & Duggan, S. N. (2022). Training 1,200 dietitians: An evaluation of a training course for non-specialist dietitians on the management of pancreatic exocrine insufficiency. *Clinical Nutrition Open Science*, 44, 155-162. <https://doi.org/10.1016/j.nutos.2022.07.002>

Published in:
Clinical Nutrition Open Science

Document Version:
Publisher's PDF, also known as Version of record

Queen's University Belfast - Research Portal:
[Link to publication record in Queen's University Belfast Research Portal](#)

Publisher rights

Copyright 2022 the authors.

This is an open access article published under a Creative Commons Attribution-NonCommercial-NoDerivs License (<https://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits distribution and reproduction for non-commercial purposes, provided the author and source are cited.

General rights

Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact openaccess@qub.ac.uk.

Open Access

This research has been made openly available by Queen's academics and its Open Research team. We would love to hear how access to this research benefits you. – Share your feedback with us: <http://go.qub.ac.uk/oa-feedback>



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

Clinical Nutrition Open Science

journal homepage:
www.clinicalnutritionopenscience.com



Original Article

Training 1,200 dietitians: An evaluation of a training course for non-specialist dietitians on the management of pancreatic exocrine insufficiency

Mary E. Phillips ^{a,*}, Laura M. McGeeney ^b, Oonagh Griffin ^c,
Kathryn Freeman ^d, Sarah Dann ^e, Sinead N. Duggan ^f, Committee Members
of the Nutrition Interest Group of the Pancreatic Society of Great Britain and
Ireland

^a Department of Nutrition and Dietetics, Royal Surrey County Hospital NHS Foundation Trust, UK

^b Department of Nutrition and Dietetics, Cambridge University Hospitals, UK

^c Department of Nutrition and Dietetics, St Vincent's University Hospital, Dublin, Ireland

^d Department of Nutrition and Dietetics, Sheffield University Hospitals, UK

^e Department of Nutrition and Dietetics, Royal Free Hospital, UK

^f Department of Surgery, Trinity College, Dublin, Ireland

ARTICLE INFO

Article history:

Received 20 January 2022

Accepted 10 July 2022

Available online 16 July 2022

Keywords:

Dietetics

Training

Continuing professional development

SUMMARY

Background: Concurrent with its evolution as medical and surgical sub-speciality, pancreatic disease is now recognised as a speciality within dietetics. Recent national guidelines have highlighted the importance of nutritional assessment and intervention in both pancreatic cancer and pancreatitis, but there is a lack of timely and appropriate nutritional support for many patients with pancreatic disease.

Methods: The Nutrition Interest Group of the Pancreatic Society of Great Britain and Ireland developed a training course for non-specialist dietitians in 2014. Improvement in knowledge was assessed using questionnaires carried out before and after the training course, and results assessed against pre-agreed targets. Comprehensive evaluation of each aspect of the course was collated.

Results: Over four years, 1,215 dietitians attended the course in 32 different locations throughout the United Kingdom. Eight three percent completed knowledge questionnaires before and after the course. There was a significant improvement in test scores ($22.2 \pm$

* Corresponding author. Department of Nutrition and Dietetics, Royal Surrey County Hospital NHS Foundation Trust, Egerton Road, Guildford, GU2 7XX, United Kingdom. Fax: +441483 464868.

E-mail address: mary.phillips1@nhs.net (M.E. Phillips).

<https://doi.org/10.1016/j.nutos.2022.07.002>

2667-2685/© 2022 The Author(s). Published by Elsevier Ltd on behalf of European Society for Clinical Nutrition and Metabolism. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

5.3 vs. 35.8 ± 4.0, $P < 0.0001$), with 94% of delegates achieving the target score for non-specialists. The course was well evaluated with 98% of all markers graded as 'good' or 'excellent'.

Conclusions: Targeted educational initiatives delivered outside of normal working hours are an effective means of training and educating a large number of health care professionals over a large geographical area within a short timeframe.

© 2022 The Author(s). Published by Elsevier Ltd on behalf of European Society for Clinical Nutrition and Metabolism. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Pancreatology is a new sub-speciality in both medicine and surgery, with patients historically treated by general physicians or general surgeons. Consequently, the dietetic management of patients with pancreatic disease is a similarly recent development. In 2001, specialist units for pancreatic surgery as part of the improving outcomes guidance were established in the United Kingdom (UK) [1], although it was not until 2013 that NHS England guidance specified that dietitians should be core members of the pancreatic multi-disciplinary team [2]. Subsequently many tertiary centres were initiated without dedicated dietetic funding [3], and whilst many pancreatic units now have specialist posts, services remain underfunded, and there is a lack of standardised training at both an undergraduate and post-graduate level.

The Nutrition Interest Group of the Pancreatic Society of Great Britain and Ireland (PSGBI) was founded in 2007 and has organised an annual dietetic training symposium as a satellite meeting to the main PSGBI annual conference since its inception. Attendance is targeted to those working in pancreatic disease. In addition, over the last ten years several resources have been developed in the form of pocket guides [4] and clinical reviews/guidelines [5–7]. However patient groups have identified a lack of access to specialised pancreatic dietetic care [8] and a lack of information provided to those with pancreatic cancer [9]. Due to the lack of specialist dietetic posts, and the heavy caseloads of specialist dietitians in post, many patients are typically seen by non-specialist dietitians who are often untrained in pancreatic disease.

Clinical concerns regarding a lack of intervention by specialist pancreatic dietitians include: the delay in recognising and treating pancreatic exocrine insufficiency (PEI); inappropriate dietetic intervention, failure to identify those at risk of malabsorption and therefore malnutrition with a resultant delay in initiating timely enteral or parenteral nutrition support, delayed identification of nutritional deficiencies and their consequences, including osteoporosis.

In many cases, non-specialist dietitians are required to identify nutrition-related problems in pancreatic patients, and to intervene, treat, monitor and/or refer such patients, and therefore, a basic knowledge of pancreatic disease is a vital learning objective for all dietitians.

In response to the identified deficit in training the Nutrition Interest Group of the PSGBI (NIGPS) developed a training programme for non-specialist dietitians focusing specifically on the management of patients with PEI, and the use of pancreatic enzyme replacement therapy (PERT).

In order to provide evidence of ongoing professional education, and to assess the efficacy of this course, a knowledge questionnaire was developed.

Methods

Courses were designed by NIGPS members to be delivered by specialist pancreatic dietitians between November 2014 and October 2018. The target audience was non-specialist dietitians, and final year undergraduates. Courses were run over two and a half hours, with a 30-minute break. In order to make this course accessible to all members of dietetic departments without study leave or clinical cover constraints, this course was run in the late afternoons, on Saturdays or in the evenings. Funding

was achieved through an unconditional educational grant from industry (Mylan Pharmaceuticals) to facilitate free-of-charge attendance.

The course content included anatomy of the pancreas, digestion, causes and identification of PEI, management of PERT, a basic overview of type 3c diabetes, pancreatic surgery and enteral feeding with PEI. Four interactive case studies were then discussed. These case studies were patients presenting in non-specialist centres, and deemed to be representative of patients seen by non-specialist dietitians.

On arrival delegates were asked to complete a knowledge-based questionnaire (Supplement 1). This questionnaire assessed knowledge of the physiology of the pancreas, conditions associated with PEI, symptoms of malabsorption, and knowledge of current recommended management. The questionnaire consisted of 10 multiple choice questions with a maximum correct score of 43 marks. The minimum expected score was set at 14 (33%); this assumed the delegate had a basic knowledge of the function of the pancreas and understood that diseases of the pancreas can cause PEI and diabetes. This score did not allow for any knowledge of dietary management or indications for PERT. A score of 30 (70%) represented a safe knowledge of the symptoms of malabsorption, an awareness of first line management of PEI and a basic use of PERT, and was the target outcome for the post-course assessment paper for non-specialist dietitians. A score greater than 40 (93%) represented a solid knowledge base of both PEI and PERT. The questionnaire was then completed by attendees at the end of the course and the results compared.

At the end of the course, delegates were asked complete an evaluation form to grade nine aspects of the course, including each section of the clinical content, the pace of the course; knowledge questionnaire and information pack. Grading was classified as excellent, good, average or poor. (Supplement 2).

Delegate packs included copies of key publications, a printed copy of the presentation slides and copies of patient literature on PERT.

The results of the knowledge questionnaire were collated and analysed using a paired T-test. All delegates had the option to complete the questionnaires anonymously. This study was classified as service evaluation using the Health Research Authority criteria, and therefore ethical approval was not required. Data analyses were carried out in IBM SPSS Statistics for Windows, version 26, (Armonk, NY:IBM Corp).

Results

In total 1,215 dietitians attended the course across 32 course venues (Table 1). Of those, 998 dietitians (82%) completed both pre- and post-course questionnaires. The completion rates of the questionnaires varied considerably: four courses over ran due to a late start due to traffic congestion, resulting in low completion rates (<70%) as delegates arrived late, missing the first paper, and left as soon as the course was completed. In all other courses the completion rate was over 80%.

Results improved significantly with baseline mean score of 22.2 ± 5.3 , compared to a post course mean score of 35.8 ± 4.0 ($P < 0.0001$) (Fig. 1).

Results were divided to assess the number of delegates who reached the pre-set standard of 70%, with only 11% of delegates reaching this standard prior to the course. This increased to 94% at the end of the course, with 20% achieving the standard set for specialist (>93% correct answers) (Table 2).

Eight hundred and twenty-five evaluation forms providing a total of 7,430 evaluation points were analysed. Overall, 97.8% of delegates rated all nine aspects of the course as good or excellent. 2% graded one aspect of the course as average. Only 4 delegates (on 4 different courses) rated one aspect of the course as poor, in all 4 cases delegates felt the pace of the course to be too fast. Given the distribution of these comments, it was assumed that these related to individual factors for that specific participant. Comments on the course are included in Table 3.

Discussion

Pancreatology is a new subspecialty of medicine, evolving after the development of specialist surgical centres in 2001. At present there are very few trainees in pancreatology in the UK, and it is not yet formally recognised as a formal training speciality in medicine. This is very much an evolving area in surgery, medicine and dietetics.

Table 1
Distribution of delegates and completion of data sets across venues.

Venue	Total attendees	Number of complete data sets	% Complete data sets
Southampton	21	19	90%
Farnborough, Hampshire	42	35	83%
Belfast 1	18	17	91%
Manchester 1	41	33	80%
Bedford	24	24	100%
Manchester 2	33	29	88%
London 1	48	41	85%
Kent	43	40	93%
Broomfield	23	23	100%
Oxford	41	40	98%
Belfast 2	41	41	100%
Cambridge	45	45	100%
Norfolk	29	29	100%
London 2	74	32	43%
Winchester	34	16	47%
Bristol	32	22	69%
Slough	17	17	100%
Bedford	28	25	89%
Devon	31	23	74%
Hertfordshire	55	53	96%
Nottingham	31	27	87%
Guildford 1	26	9	35%
Birmingham 1	18	13	72%
Middlesborough	54	43	80%
Guildford 2	57	53	93%
Wirrel	69	57	83%
Edinburgh 1	32	24	75%
Sheffield	35	28	80%
Fife	10	10	100%
Cornwall	29	24	83%
Birmingham 2	55	41	75%
Edinburgh 2	79	65	83%
Total	1215	998	82%

Patients with pancreatic disease can experience significant malnutrition, both in terms of protein-energy malnutrition and micronutrient deficiencies [10,11]. Nutritional intervention has been shown to be as effective as supplementation when carried out by an experienced dietitian [12]. However, in one Dutch study, interventions in those who had seen a non-specialist dietitian were compared with those who had not seen a dietitian, and there was no difference in the number of patients following inappropriate nutritional advice [13], confirming the need for specialist dietetic services.

Dietitians specialising in pancreatic disease often work in tertiary referral centres for pancreatic surgery, and manage patients with acute and chronic pancreatitis, pancreatic cancer and those undergoing pancreatic surgery. However, many patients do not receive care in tertiary centres, and in some centres dietetic services are restricted to those with malignant disease only [3]. The recent National Institute for Care Excellence (NICE) guidelines recommended the administration of pancreatic enzyme replacement therapy for all patients with inoperable pancreatic cancer and before and after pancreatic resection [14] and furthermore recommendations are made that all patients with chronic pancreatitis should be seen by a dietitian, and that there should be the formulation of networks of dietitians to allow non-specialist dietitians to obtain support from those specialising in the field. [15].

Unlike patients with other diseases or conditions, those with PEI may present in any clinical dietetic speciality. Patients with acute or chronic pancreatitis, or pancreatic cancer are managed in primary care, under outpatient gastroenterology or surgical services, in intensive care, emergency admission units, general surgical and gastroenterology wards, and those with pancreatic cancer will be also be seen in oncology units. Patients may also have type 3c diabetes and therefore present to endocrinology

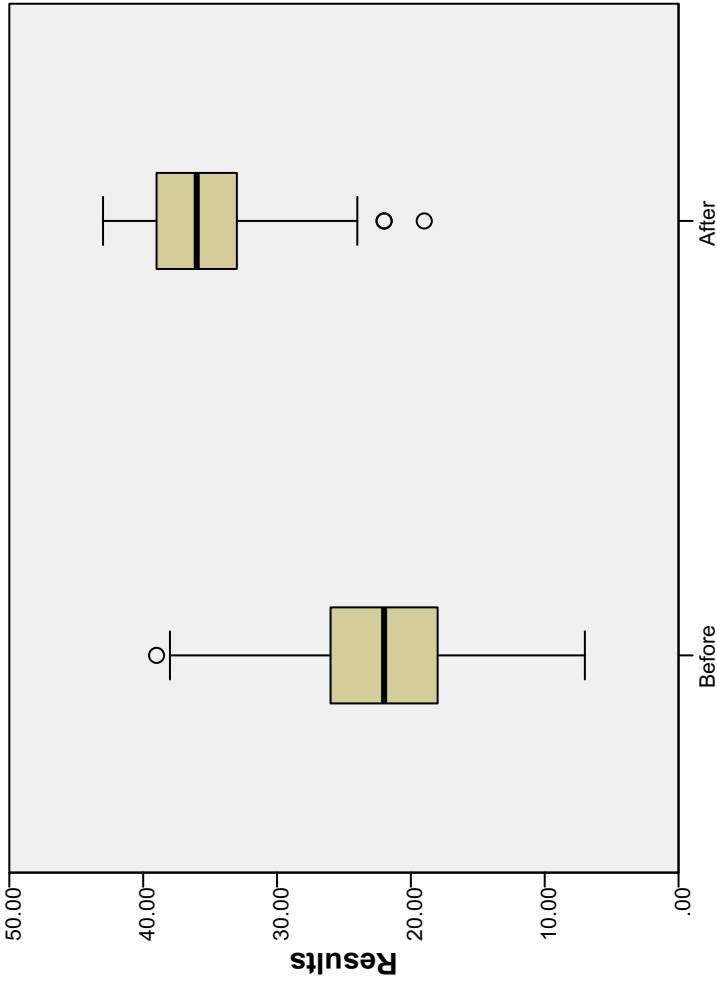


Fig. 1. Box and Whisker plot comparing results before and after training ($P < 0.0001$).

Table 2
Statistical analysis of results before and after training (n=998)

	Questionnaire results before the course	Questionnaire results after the course
Mean (±SD)	22.3 ± 5.4 ^a	35.8 ± 3.9 ^a
Median	22	36
Range	7–38	19–43
Number of delegates achieving > 14 (33%)	928 (93%)	998 (100%)
Number of delegates achieving > 30 (70%)	109 (11%)	938 (94%)
Number of delegates achieving > 40 (93%)	0	200 (20%)

^a P<0.0001.

Table 3
Comments on the course evaluation

Overall comments on the course	Comments about timing and need for training
<ul style="list-style-type: none"> - I have learnt so much in a short period of time - Case studies were great – good to see real life environments - Wish it was recorded so I could listen to it again. Very helpful, will change my practice, valuable course - Excellent course, very useful just fast paced - Very knowledgeable, practical advice, good case studies - Thought it was superb and for free! - One of the most enjoyable and informative study days I have ever attended (I qualified in 1977 – so this is compliment) 	<ul style="list-style-type: none"> - Would be good to cover this at University - Really liked the timing – no need to ask for time off work - A lot of information to take in after work - Could do with a longer session, but appreciate the evening session - I have been to so many study days and the content of this evening was far superior and a really effective and good use of my time - Everyone should do this course - This could be very beneficial to junior doctors - Please invite gastroenterologists and surgeons to future events! - Having this as a study evening meant the whole team could attend - Prefer timing to be changed to the morning – very long day

services. Those with PEI may develop an unrelated condition such as a stroke or cardiovascular disease, cancer or renal failure and consequently require treatment in other dietetic specialities.

Dietetic training at undergraduate level is designed to provide a basic knowledge of management of specialist conditions in order that graduates can instigate first line management and refer to specialist centres for support. This style of specialist peer support is well established in specialities such as intestinal failure, cystic fibrosis and renal disease. Conditions that present more widely such as diabetes and dysphagia are considered to be *core competencies* for all dietetic graduates. As PEI is a symptom of multiple diseases, an argument can be made for the management of PEI to be treated as a core competence for all new graduates. Inclusion of the identification and first line management of PEI should be considered in undergraduate courses. The evaluation form comment: ‘I didn’t know what I didn’t know’ summarises need for training across all dietetic non-specialists.

Patient groups have raised formal concerns over the lack of access to pancreatic dietetic support [8,9]. One small study of chronic pancreatitis patients attending a tertiary centre found that 38% of patients were at risk of developing malnutrition. Of those high risk patients, only 27% had received any nutritional intervention, highlighting an shortfall in service provision [16]. With this lack of intervention apparent within a tertiary centre, it is likely that services are likely to be even less accessible in non-specialist centres. Furthermore, the delay in recognising and treating PEI has been cited as the primary unmet supportive care need amongst pancreatic cancer patients and/or their bereaved carers [17], with many patients describing it as adding unnecessary, additional distress. Service development should include projects to improve access to dietetic services through more robust referral mechanisms and appropriate service provision.

This is the first study to evaluate the efficacy of formal training on the management of pancreatic disease for dietitians. Practical training has been evaluated using scenario based learning and shown to

be effective in the development of complex technical skills such as the management of parenteral nutrition [18]. Work looking at developing nutritional strategies in nutrition support teams identified that a structured approach with varying delivery methods to suit the needs of individual learners [19]. Further work should explore the utilisation of other teaching styles to provide accessible training to those with different learning styles.

A study from The Netherlands evaluated the impact of a 28-hour course on the knowledge of renal dietitians, showing a significant improvement in 3 out of 4 assessment areas [20]. In this study a more detailed assessment of knowledge was undertaken, with assessment results divided into subcategories according to the subject being assessed. This detailed degree of assessment and evaluation would also be of benefit in the training of dietetic professionals on pancreatic disease.

Structured education programmes are also available through universities, either as masters level modules and degrees in clinical nutrition, and by specialist interest groups such as the European Society of Parenteral and Enteral Nutrition (ESPEN). ESPEN offer a diploma in clinical nutrition on their lifelong learning (LLL) programme. This course includes modules on acute pancreatitis and chronic pancreatitis, is formally examined, and charges fees for each module. [21] Face-to-face training tends to occur at European conferences, and the combined costs of the conference fees, travel and accommodation, may make this style of training less accessible.

Ongoing education is a key part of any healthcare related career, and in the United Kingdom & Ireland, is a condition of ongoing registration for dietitians with the health care professions council. In the current financial climate, where the availability of funding for education is restricted, courses that are free to attend are essential for the profession to meet ongoing training needs. In a clinical area that is still developing an evidence base, a rolling programme of education should be developed to improve the clinical care of these nutritionally vulnerable patients.

The cost of education is only one factor this course highlights. This also highlights the commitment of professionals to attend training outside of their working hours, giving up their free time.

The limitations of this study centre around the lack of data on long term knowledge and practical application. Validation of the knowledge assessment tool would add to the calibre of the training.

Further work should be carried out to identify other unmet training needs, and educational courses run outside of traditional working hours allow more dietitians to access continuing professional development, and should be considered as a model for other disciplines.

Conclusion

Overall, this course demonstrated a significant improvement in knowledge and was well evaluated with 98% of all aspects graded as excellent or good. Evening and weekend courses are well attended. . This course should be continued, and other specialty groups could consider this method of delivery for short update courses. Further work should evaluate the ability to apply and retain this knowledge, explore different teaching styles and to develop education at undergraduate level to ensure a basic knowledge is achieved by all dietitians at qualification.

Author contribution

MEP contributed to the design of the work, acquisition of data, data analysis and interpretation, and critically drafted and revised the article, LMM, OG, SD and KF contributed to the design of the work, acquisition of data, data analysis, and critically appraised the article; SND contributed to the design of the work, data analysis and interpretation, and critically appraised the article. All authors reviewed and approved the final version prior to submission.

Source of funding

This course was funded by an unconditional educational grant from Mylan Pharmaceuticals. This covered the cost of running the courses, including honoraria for speakers, and the cost of printing and sourcing delegate packs. Mylan did not have any input to the content of the course or assessment. They have not had access to the data, nor been involved in the production of this article.

Conflict of interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: MEP sits on advisory panel for Mylan, and has received honoraria for speaking from Mylan, Nutricia, Merck and Sanofi. LMM, KF, SD and SND have received honoraria for lectures from Mylan, SND has received an unrestricted research grant from Mylan.

Acknowledgements

Elizabeth Bradley, Lois Temple, Victoria Mann, Nadeen Low, Karen Robinson, Linda Knowles, Emma Westmancoat, Edward Griffiths, Charlotte Morrison, Victoria Carter, Katrina Clifton and Tom Lander for their assistance in running these courses. Irantzu Arregui-Fresneda, Professor Colin Johnson, Dr Fanny Shek and Mr Neil Pearce for their support in developing this course. Mylan Pharmaceuticals for providing the unconditional educational grant to cover the costs of running these courses.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nutos.2022.07.002>.

References

- [1] Improving NICE. Outcomes on upper GI cancers. NICE Cancer Service Guidance; 2001.
- [2] Nhs E. A02/S/a 2013/14 NHS Standard Contract for hepatobiliary and pancreas (adult) Particulars, Schedule 2 - the services. A - Service specifications; 2013.
- [3] Phillips M, Lordan JT, Menezes N, Karanjia ND. Feeding patients following pancreaticoduodenectomy: a UK national survey, vol. 91. *Annals of the Royal College of Surgeons of England*; 2009. p. 385–8.
- [4] Phillips ME, Arregui-Fresneda I, Duggan S, Freeman K, McGeeney L. In: Todorovic V, Micklewright A, editors. *Pancreatic disease. A pocket guide to clinical nutrition*. 4th Edition. British Dietetic Association; 2013 [Chapter 20].
- [5] Duggan SN, Conlon KC. Bone health guidelines for patients with chronic pancreatitis. *Gastroenterology* 2013;145:911.
- [6] Duggan SN, Ewald N, Kelleher L, Griffin O, Gibney J, Conlon KC. The nutritional management of type 3c (pancreatogenic) diabetes in chronic pancreatitis. *Eur J Clin Nutr* 2016.
- [7] Arvanitakis M, Ockenga J, Bezmarevic M, Gianotti L, Krznicar Z, Lobo DN, et al. ESPEN guideline on clinical nutrition in acute and chronic pancreatitis. *Clin Nutr* 2020;39:612–31.
- [8] Pancreatitis Supporters Network. Personal correspondence. 2015.
- [9] Pancreatic cancer UK. Personal Correspondence; 2015.
- [10] Duggan SN, Smyth ND, O'Sullivan M, Feehan S, Ridgway PF, Conlon KC. The prevalence of malnutrition and fat-soluble vitamin deficiencies in chronic pancreatitis. *Nutr Clin Pract : official publication of the American Society for Parenteral and Enteral Nutrition* 2014;29:348–54.
- [11] Schnelldorfer T, Adams DB. The effect of malnutrition on morbidity after Surgery for chronic pancreatitis. *The Am Surg* 2005;71:466–72. ; discussion 72-3.
- [12] Singh S, Midha S, Singh N, Joshi YK, Garg PK. Dietary counseling versus dietary supplements for malnutrition in chronic pancreatitis: a randomized controlled trial. *Clin Gastroenterol and Hepatol: The Official Clinical Practice Journal of the American Gastroenterological Association* 2008;6:353–9.
- [13] Sikkens EC, Cahen DL, van Eijck C, Kuipers EJ, Bruno MJ. Patients with exocrine insufficiency due to chronic pancreatitis are undertreated: a Dutch national survey. *Pancreatol : Official Journal of the International Association of Pancreatology*. 2012; 12:71–3.
- [14] NICE. Pancreatic cancer in adults: diagnosis and management (NG85). National Institute for Health and Care Excellence; 2018.
- [15] NICE. Pancreatitis. NG104). National Institute for Health and Care Excellence; 2018.
- [16] Parmanandi BP, El-Sayed PS, Joshi GH, Ghai D, Koshy A, Chapman K, et al. The burden of poor nutrition in chronic pancreatitis: what are the impact of behavioural and socioeconomic factors. *Gut* 2014;63. PTH 121.
- [17] Gooden HM, White KJ. Pancreatic cancer and supportive care—pancreatic exocrine insufficiency negatively impacts on quality of life. *Support Care Cancer* 2013;21:1835–41.
- [18] Raphael BP, Takvorian-Bene M, Gallotto M, Tascione C, McClelland J, Rosa C, et al. Learning Gaps and Family Experience, Nurse-Facilitated Home Parenteral Nutrition Simulation-Based Discharge Training: Proof-of-Concept Study. *Nutr Clin Pract : Official Publication of the American Society for Parenteral and Enteral Nutrition* 2021;36:489–96.
- [19] DeChicco R, Neal T, Guardino JM. Developing an education program for nutrition support teams. *Nutr Clin Pract : Official Publication of the American Society for Parenteral and Enteral Nutrition* 2010;25:481–9.
- [20] Karavetian M, Rizk R. Development and evaluation of continuing education course in renal nutrition. *Nutr Res Pract* 2016; 10:99–107.
- [21] ESPEN. Life Long Learning (LLL) Programme [07/07/2022]. Available from: <https://www.espen.org/education/lll-programme>.