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RESEARCH

Opinions of South African dietitians on fistuloclysis as a treatment option for intestinal failure patients

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Introduction: Intestinal failure is the consequence of diverse aetiologies and pathophysiological causes. Fistuloclysis is an effective means of nutritional support to selected intestinal failure patients. This study aimed to investigate the management of adult intestinal failure patients in hospitals in South Africa, determining how practical and acceptable fistuloclysis is.
Methods: The current management of type 2 and type 3 intestinal failure patients in South African hospitals was investigated by means of occupation-specific questionnaires, evaluating perceptions and opinions among dietitians.
Results: Twenty-seven dietitians indicated willingness to participate in the survey, the majority (67%) having been involved with patient management in this field for one to five years. All indicated correctly that high fistula outputs would be defined as intestinal failure. Only 47% gave the correct definition of fistuloclysis, while 28% were currently utilising it as a means of nutrition support. All respondents agreed that unsuccessful implementation of fistuloclysis was due to training shortfalls and resistance from clinicians and nursing staff.
Conclusion: There is a positive perception and awareness of fistuloclysis; however, numerous stumbling blocks hamper the wider use of this novel treatment.

Keywords: Fistuloclysis, Intestinal failure, Parenteral nutrition

Introduction

Intestinal failure (IF), its complications and costs associated with parenteral nutrition (PN) support in this particular patient population are a reality in the South African context. Owing to the nature and complexity of IF, long-term hospitalisation and PN support to improve or maintain nutritional status is often required to, allow enough time between surgical interventions, and time to treat pre-existing complications, before a patient can be considered for definitive surgery.[1,2]

Fleming and Remington first defined the concept of IF in 1981 as 'a reduction in the functional gut mass below the minimal amount necessary for adequate digestion and absorption of food'.[3–5] This definition of IF has since been revised by other authors to include, among others, duration, stage, degree of impairment and underlying causes. In 2014, the European Society for Clinical Nutrition and Metabolism (ESPEN) published recommendations on the definition and classification of IF in adults. According to the ESPEN classification, IF can be defined as 'the reduction of gut function below the minimum necessary for absorption of macronutrients and/or water and electrolytes, such that intravenous (IV) supplementation is required to maintain health and/or growth'.[3] The need for IV replacement of nutrients and/or fluids is used as a surrogate marker for the diagnosis of IF in the absence of readily available complex metabolic studies.[3,6]

Micronutrients are not included in the definition, and micronutrient deficiencies alone due to gut impairment are not classified as IF. In situations where the absorptive ability of the gut is impaired, but not to the degree that IV supplementation of fluid and/or nutrients is required to maintain health and growth, the condition can be referred to as 'intestinal insufficiency'.[3] IF has been sub-divided into three types based on the onset and expected metabolic impact and outcome.[3,7,8] Type 1 IF is usually self-limiting, short term and often perioperative.[9–11] Common causes of type 1 IF include mechanical intestinal obstruction and non-mechanical ileus.[10] Type 1 IF usually resolves within seven to 14 days with conservative management and nasogastric drainage, and might require short-term PN support.[10,12] Type 2 IF is a serious condition associated with a higher incidence of mortality.[3,10] Patients usually develop type 2 IF as a result of complications of abdominal surgery leading to abdominal sepsis and intestinal fistulation.[10] An estimated 10% of patients will also have significant reduction in intestinal length at the time of diagnosis.[10] Type 2 IF is usually not self-limiting, with the exception of patients with simple intestinal fistulation where spontaneous closure may occur with effective nutritional and medical support.[10] Type 3 IF refers to a chronic condition in a metabolically stable patient, requiring long-term PN support, often for years, with careful monitoring for complications.[3,9,11]

Fistuloclysis, i.e. feeding of intestinal effluent via a distal intestinal fistula or stoma, is an effective and feasible way of managing patients with IF and is often the only alternative to long-term PN support.[13,14] Enteral nutrition (EN), apart from being less costly, has considerable advantages over PN support.[15] The advantages include improved gut barrier function, reduction in infectious morbidity and improved immune function.[15]

In a resource-scarce environment, there is a need to explore novel treatment options that are effective in promoting the medical and nutritional status of patients, while minimising risk, improving quality of life and reducing cost. Fistuloclysis is a feasible, but underutilised, option for the management of IF in the South African context. The motivation for this study was to

collect information regarding the management of IF as well as the opinion and perceptions of dietitians regarding fistuloclysis. This information will be useful in terms of establishing equipment and training needs and the readiness of institutions to adapt to a novel nutritional management solution.

Methods

Study population

Dietitians working in South Africa who are currently involved in the nutritional management of IF patients were eligible for inclusion. Although it was anticipated that the number of dietitians that meet the above-mentioned criterion would be relatively small (mainly those associated with tertiary and maybe secondary hospitals, as well as private practicing dietitians associated with private hospitals), it was not possible to predict the exact number as no such register exists. Since the principal investigator is responsible for the nutritional management of IF patients at Groote Schuur Hospital, the latter institution was excluded.

Study design and methods

A descriptive observational study of the current management of IF patients in South African hospitals, as well as of the perceptions and opinions of dietitians about fistuloclysis as a treatment option for IF was done by means of a self-administered questionnaire.

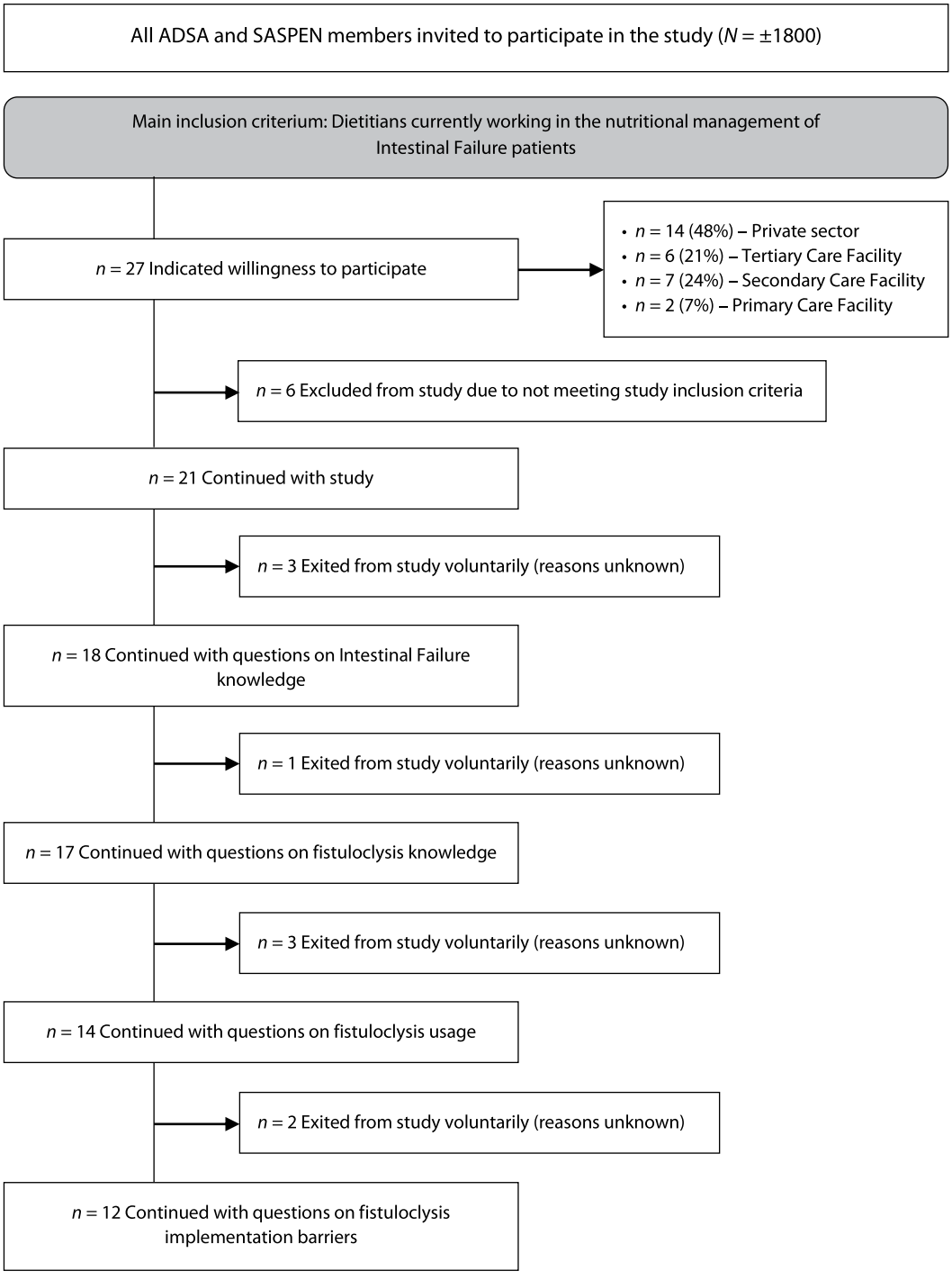

Figure 1: Flow chart indicating participation in study.

The questionnaire was developed in consultation with professionals currently involved in the management of IF patients in Groote Schuur Hospital where fistuloclysis had been implemented successfully. The questionnaire was validated for face and content validity and underwent interdisciplinary review. Minor adaptations were made accordingly. The web-based system, Survey Monkey, was used to manage the survey. The inclusion criterion was dietitians currently involved in the management of IF patients in South African hospitals other than Groote Schuur Hospital. In an attempt to adhere to the inclusion and exclusion criteria, questions were built into the questionnaire that would exit the respondents from the survey early if they did not fit the criteria. An example of such a question was 'Are you currently involved in the management of intestinal failure patients?', and if the respondent answered 'no', they were exited from the questionnaire. If respondents did fit the inclusion criteria but were not familiar with the term fistuloclysis, they were given a brief explanation and allowed to continue with the survey. The survey took approximately 15 min to complete.

The survey was advertised via the Association for Dietetics in South Africa (ADSA) and the South African Society for Parenteral and Enteral Nutrition (SASPEN), since many registered dietitians (around 60–65%) in South Africa belong to either of these organisations. An email containing a link to the Survey Monkey questionnaire was distributed via the mailing lists of ADSA and SASPEN to recruit dietitians for participation ($N = \pm 1800$). A second email was sent out two weeks after the first as a reminder. The survey remained open for completion for a total of four weeks.

Statistical analysis

The data obtained from Survey Monkey were downloaded in the form of an Excel spreadsheet. The data were analysed by the principal investigator using Microsoft Excel and reported as descriptive statistics.

Ethics

Ethics approval was obtained from the Stellenbosch University Health Research Ethics Committee (Reference # S14/09/177).

Questionnaires were completed anonymously through Survey Monkey and willingness to participate in the study was regarded as informed consent. Standard to any research study, participants had the opportunity to exit the study at any time if they so wished, without providing reasons for doing so.

Results

A flowchart depicting the participating in the study is displayed in Figure 1. Twenty-seven dietitians indicated willingness to participate in the survey. As can be seen from Figure 1, there was almost a 50:50 split between participation from the public and private sectors with the majority of respondents from the public sector being in secondary or tertiary healthcare institutions.

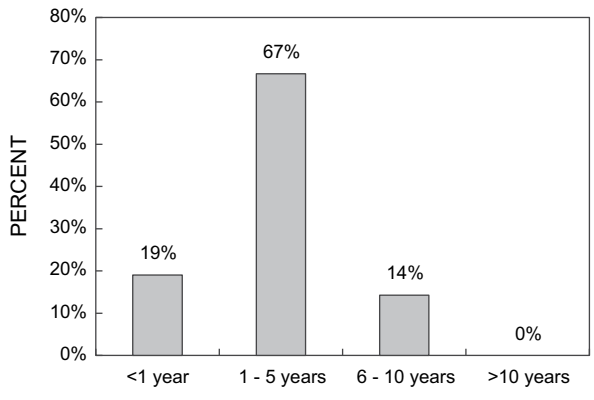

Figure 2: Respondents' years of experience in the management of intestinal failure patients.

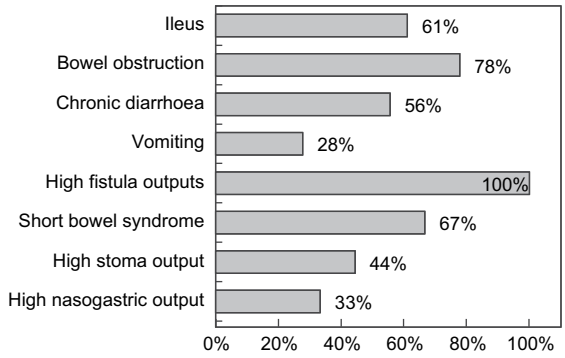

Figure 3: Conditions regarded as intestinal failure by respondents.

Six respondents were excluded from the survey since they were not directly involved in the nutritional management of IF patients in their current practices, thus not meeting the primary inclusion criteria of the study. The years of experience in the field of IF of the 21 respondents that continued with the survey are displayed in Figure 2. The majority of respondents, i.e. 67% ($n = 14/21$), had been involved with patient management in this field for one to five years.

Respondents were given eight options of clinical conditions or clinical presentations, and asked to indicate which of these they would regard as IF (a choice for 'more than one' option was provided) (Figure 3). Only 18 out of 21 respondents answered this question and continued with the survey (Figure 1). All the respondents indicated that high fistula outputs ($n = 18/18$, 100%) would be defined as IF, while ileus ($n = 11/18$, 61%), short bowel syndrome ($n = 12/18$, 67%) and bowel obstruction ($n = 14/18$, 78%) were also often indicated as IF.

Seventeen respondents continued with the survey to answer the section on fistuloclysis knowledge. This section contained an open-ended question where respondents had to explain their understanding of the term fistuloclysis. The majority ($n = 9/17$, 53%) could not provide a correct explanation. Majority of those who provided the correct interpretation of the term fistuloclysis [47%; ($n = 8/17$)] were employees in public sector tertiary hospitals ($n = 4/8$, 50%), followed by equal representation from public sector secondary ($n = 2/8$, 25%) and private hospitals ($n = 2/8$, 25%).

Another three participants exited the study and only fourteen responded to the question on whether they had ever used fistuloclysis before in their current or previous settings. This section consisted of closed and open-ended questions. Of the fourteen participants, 43% ($n = 6/14$) had used it before, 28% ($n = 4/14$) were using fistuloclysis in their current settings and, similarly, 28% ($n = 4/14$) had never used it as a treatment method. Interestingly, 50% of respondents who were familiar with the term and could provide a correct description in the previous section, had never used fistuloclysis as a treatment method. The current users were spread between the public sector in secondary hospitals ($n = 2/4$, 50%) and tertiary institutions ($n = 1/4$, 25%) and one in the private sector ($n = 1/4$, 25%). Two indicated that

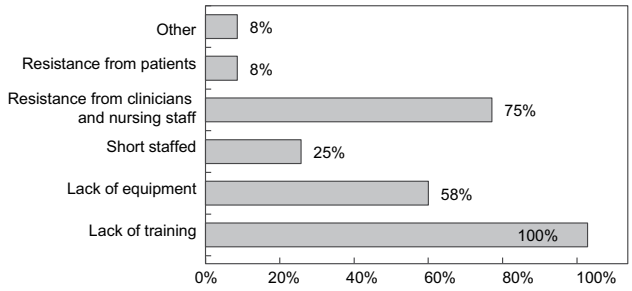

Figure 4: Reasons identified for unsuccessful implementation of fistuloclysis.

they had only used it on one or two patients in the preceding two years and did not have much experience with it. Three of the four (n = 3/4, 75%) currently using fistuloclysis thought that it was a practical and achievable option for nutrition support. One respondent said '*If it is something that is effective then it would be great if it became more common practice. I must admit I have not researched it but will definitely after this survey.*' The three respondents also indicated that patients experienced fistuloclysis as an acceptable mode of nutrition support. One volunteered comment was: *'Our patient actually preferred it to the TPN* [Total Parenteral Nutrition]. *She found the TPN catheter site very uncomfortable'.*

PN was indicated as the treatment modality most commonly used in institutions where fistuloclysis was not done or when fistuloclysis was not possible for an individual patient. In those cases, PN was used either as a first line treatment early in the management course, or reverted to if other methods like EN or oral intake failed. Failing of enteral or oral nutrition seemed to be regarded as an increase in output from the stoma or fistula above a tolerable level.

Respondents were given five common stumbling blocks for the successful implementation of fistuloclysis and were asked to indicate which of the five options were applicable in their opinion/institution. All the respondents agreed (Figure 4) that lack of training (n = 12/12, 100%) contributed to the unsuccessful implementation of fistuloclysis in their institutions. The second most prevalent reason was perceived as resistance from clinicians and nursing staff (n = 9/12, 75%), with lack of equipment (n = 7/12, 58%) ranking third.

All respondents agreed that they would consider fistuloclysis as a method of nutritional support if they had more information and a protocol available to guide the process.

Discussion

This study was the first in South Africa that attempted to determine the opinions of dietitians on fistuloclysis as a treatment option for the management of IF patients. Few dietitians (47%) knew the correct definition of fistuloclysis, with an even smaller number (28%) currently utilising it as a means of nutrition support.

A major limitation of the study is the small participation rate. This was partly expected since an inclusion criterion was for the dietitians to be currently working with the nutritional management of IF patients. The latter would only be admitted to tertiary or some secondary public-sector hospitals, or alternatively to private hospitals. As there is no register indicating health professionals working with IF patients, it was not possible to identify relevant dietitians for targeted sampling.

South African statistics on the incidence of IF are not available. Data from hospitals in England indicate that the incidence of IF is in the region of 18 per million of the population per year; this was based on patients receiving PN support for at least 14 days.[10] If this were to be extrapolated to the South African context, the number of such patients would amount to roughly 970 patients per year, out of a population of around 55 million. It could therefore be postulated that the number of dietitians working in the field of clinical dietetics and who manage IF patients is quite limited. This may be the reason for the small number of responses received. There was good representation within the 27 participants of the public as well as private healthcare sectors. Most participants from the public setting were involved in care at secondary and tertiary level where management of IF patients is expected.

A diverse number of clinical conditions all resulting in either increased losses and decreased absorption of nutrients were regarded as IF by participating dietitians. This is in line with the definition of IF provided by ESPEN who classifies IF according to a functional and pathophysiological classification.[3] The pathophysiological classification includes five primary pathologies: short bowel syndrome (SBS), intestinal fistula, intestinal dysmotility, mechanical obstruction and extensive small bowel mucosal disease.[3]

When asked to indicate conditions that can be regarded as IF, 67% of the respondents indicated that they associate SBS with IF. SBS could result from extensive surgical resection due to a number of indications or as a result of congenital disease of the small intestine.[3,16–18] The pathophysiological manner in which SBS causes IF is due to extensive loss of absorptive surface area.[3,19] SBS is the leading cause of type 3 IF and accounts for around 75% of adults receiving home parenteral nutrition (HPN) in Europe.[3]

Intestinal fistula is defined as an abnormal communication between two epithelium-lined surfaces.[2,3,13,20–22] Classification of fistulae can be done on the basis of the anatomy, physiology or aetiology.[13,21–24] The physiological classification for fistulae is based on output and defines less than 200 ml per day as low output, while 200–500 ml per day is classified as moderate output. [3,22–25] Effluent of > 500 ml per day in the fasted state is considered a high-output fistula. [3,20,22,23,25] The most common cause of intestinal fistulae are surgical complications, amounting to 75–85% of cases.[3,13,20,23,24,26–28] The remaining 15–25% of fistulae arise from the underlying pathology, with Crohn's disease being a major contributor.[3,27,28] The pathophysiological manner in which fistulae cause IF is by the loss of enteric content through a proximal opening or by bypassing a significant segment of gut in the case of internal entero-enteric fistulae.[3,21,29] All respondents agreed and indicated that a high-output fistula is associated with IF.

The term intestinal dysmotility refers to the presence of a disorder that impairs the propulsion of gut content in the absence of an obstruction.[3] Intestinal dysmotility can present as type 1 IF in the case of acute postoperative ileus or critical illness associated ileus.[3] Dysmotility often presents as a result of systemic or intra-abdominal inflammation as type 2 IF.[3] Chronic IF associated with dysmotility is referred to as chronic intestinal pseudo-obstruction (CIPO) with the 'pseudo' indicating the absence of an occluding lesion.[3] The primary pathophysiology in

intestinal dysmotility that gives rise to IF is the intolerance to oral or enteral nutrition, resulting in inadequate nutrient intake.[3] The mucosal surface is generally preserved.[3] Causes of IF correctly indicated by respondents that could be classified as intestinal dysmotility included ileus (61%), vomiting (28%) and high nasogastric output (33%)

Mechanical obstruction refers to a physical abnormality affecting the intestine.[3] This could be intraluminal (e.g. foreign bodies), intrinsic (e.g. stenosis), or extrinsic (e.g. frozen abdomen).[3] Furthermore, these might be of benign or malignant origin.[3] It could present as a type 1 IF, which presents acutely and resolves within days with conservative management or surgery. It might also present as a type 2 or 3 IF with a prolonged course.[3] The pathophysiological mechanism of IF due to mechanical obstruction is the spontaneous or prescribed ceasing of oral intake.[3] Vomiting and high nasogastric output, indicated by respondents as causes for IF, could also be the clinical manifestation of bowel obstruction. Furthermore, bowel obstruction per se was indicated as a cause of IF by 78% of respondents.

Extensive small bowel mucosal disease refers to a condition where there is intact or almost intact but inefficient mucosal surface.[3] There is a reduction in nutrient absorption and/or an increase in nutrient loss via the mucosa to the point where the nutritional needs cannot be met, e.g. coeliac disease, radiation enteritis and protein-losing enteropathy.[3] Chronic diarrhoea was correctly indicated as IF by 56% of respondents.

Only 47% of respondents were familiar with the term fistuloclysis and could give a correct explanation, with the majority of them currently working in tertiary hospitals. Despite the fact that fistuloclysis is successfully implemented internationally,[15] we could find no literature which specifically evaluates the knowledge and practices of the multidisciplinary team with regard to fistuloclysis to which our findings could be compared. This study therefore adds useful information to identify gaps and barriers in the implementation of fistuloclysis in the South African context.

Of interest was the number (50%) of respondents who were familiar with the term fistuloclysis but had never used it before. This is a positive finding since it indicates awareness concerning fistuloclysis. Since training and resistance from nursing staff and clinicians were indicated as the two leading reasons for unsuccessful implementation of fistuloclysis, awareness could potentially be turned into practice through appropriate training and advocacy. It would also have been valuable to have had sufficient information available regarding the opinions and perceptions of nursing staff and doctors on fistuloclysis, as this would have provided a more comprehensive picture regarding the management of these complex surgical cases.

Although six out of 14 respondents had used fistuloclysis in practice before, only four were using the method at that time, but indicated it was not a regular procedure in their institutions. Surprisingly, two of the four respondents using fistuloclysis at that time were situated in secondary hospitals within the public sector. This was an unexpected finding, since the assumption based on current practice was that patients with IF would be managed at tertiary level. It is encouraging that fistuloclysis can be successfully implemented at this level. The respondents did indicate that this was not the norm for nutritional management at their institution and that it had only been done in respect of one or two patients over a two-year period. All the dietitians who had used it before found it to be successful and well received by patients.

Nutrition support via the PN route was indicated as the route of choice most often used by respondents, either as a first line treatment or after enteral or oral nutrition had failed. Respondents indicated that they regarded enteral or oral nutrition to be unsuccessful if they experienced an increase in the fistula or stoma output. In the case of IF, the preferred mode of nutrition delivery would depend largely on the underlying cause, and the responses could be regarded as in accordance with evidence-based guidelines. All SBS patients will require PN support in the immediate postoperative phase to maintain nutritional status.[30] SBS with permanent PN dependence is strongly related to a small bowel length of < 50 cm post duodenum and to the absence of ileum and/or colon in continuity.[31] Values separating transient and permanent IF differ according to anatomy and are 100 cm for an end-enterostomy, 65 cm for a jejunocolic anastomosis and 30 cm for a jejunoileocolic anastomosis.[31] Bowel adaptation usually occurs within the first two years following the last surgical intervention.[18,19,30] The degree of adaptation is related to the extent of the resection as well as the anatomy of the remnant bowel.[18,32,33] Structural and functional changes occur in the remnant bowel that improves nutrient and fluid absorption.[18,19,32,33] Adaptation after two years is uncommon and limited to a maximum improvement of 5–10% in absorptive capacity.[30] In the case of fistulae, enteral nutrition support is the preferred route of nutrition support, unless it increases fistula output significantly or causes increased abdominal pain or exacerbates diarrhoea.[4,20,26] Bowel absorptive capacity should be sufficient for successful implementation of enteral nutrition support, and patients with fistulae should be able to tolerate polymeric enteral formula, unless a patient has less than 120 cm of bowel left, has documented intolerance to polymeric enteral feed, or experiences high fistula output.[21,25] In that case, the patient should be changed to a semi-elemental or elemental enteral product.[25] The literature suggests that absolute contraindications to enteral nutrition include bowel discontinuity or insufficient bowel length, usually < 75 cm.[13,25] This, however, might not be an absolute in practice. In the case of intestinal dysmotility and bowel obstruction PN would be indicated as the primary route of nutrition support.[3] The same would apply in the case of extensive small bowel mucosal disease, where intestinal nutrient absorption is completely impaired and the enteral or oral route becomes futile.[3]

Conclusion and recommendations – Acknowledging the small participation rate, we can confirm that the employment of fistuloclysis in the management of adult IF patients in South African hospitals is underutilised. It is, however, evident that the dietitians that responded were positive about the concept of fistuloclysis and were willing to apply it in patient care. Since all respondents indicated that they would consider using fistuloclysis as a means of nutrition support if they could gain the knowledge through training and had protocols available to guide the process, we can safely say that lack of training has been identified as a big stumbling block in the successful implementation of fistuloclysis. This could be addressed through training and protocol development. Nursing and clinician resistance have been identified as other potential stumbling blocks in the implementation of fistuloclysis. Therefore, the training and protocols should include these health professionals as they play a pivotal role in the successful execution thereof.

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