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New-onset Constipation After Stroke: Caspian Nursing Process Projects

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ABSTRACT

Introduction: The impacts of new-onset constipation outcomes in stroke clients have remained unclear. It seems helpful to update the structure planning with nursing-led intervention.

Objective: The current study aimed to present a protocol and methods of Caspian Nursing Process Projects in new-onset constipation by nursing-led intervention considering the experts' point of view.

Materials and Methods: The current multi-stage evolutionary study describes the protocol and methods of Caspian Nursing Process Projects, which were conducted on stroke constipation, such as new-onset constipation. The study was conducted in several phases, including searching for scientific sources, formal-content validity, RAND and Delphi methods, and changes made at the Delphi stage and the experts' panel. We selected 21 studies published between January 2004 and December 2019 in the Cochran database, Medline, Science Direct, PubMed, Elsevier, and Scopus. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) and AGREE II (The Appraisal of Guidelines for Research & Evaluation) were used to evaluate the articles and guidelines.

Results: After considering the inclusion and exclusion criteria, 14 articles and guidelines were entered. Most of the authorities were 16 men (72.7%), 11 cases had MD degrees (50%), and 4 (18.2%) were neurologists. Regarding the priority, the highest agreement was found on patient and companion education (98%) and the lowest on disability in daily activity (75.6%). In terms of benefits, patient education again achieved the highest agreement with 97.2%, and use of the Bartel index with 73.6% obtained the lowest agreement. Regarding the applicability, registration, and reporting, the water and electrolyte impairment and educational booklet obtained the highest agreement with 93.6%.

Conclusion: All recommendations had reached over 70% agreement in all four areas of the initial draft, and some care should be taken only by stroke nurses or critical care nursing. The study results can be used for developing national guidelines or criteria.

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Highlights

- The study aims to define a care plan on new-onset constipation in stroke clients.

- The highest agreement was found over patient and companion education, and the lowest agreement was found over disability in daily activity.

- In the assessment section, the highest agreement levels were in the areas of "constipation diagnosis by Rome IV criteria", "constipation risk by the Norgine instrument", "tenderness in physical examination", and "taking client medication".

- In target setting and the outcome, the highest agreement levels were in the "prevention of bowel dysfunction", "stable water and electrolyte status", "client placement in types 3 and 4 of the Bristol criteria".

Plain Language Summary

The current study aimed to define a care plan on new-onset constipation in stroke clients with Delphi and RAND (Research and Development) methods (RAM). The result showed that regarding the priority, the highest agreement was found on patient and companion education and the lowest on disability in daily activity. The highest agreement levels were obtained in the assessment section (constipation diagnosis by Rome IV criteria, constipation risk by the Norgine instrument, tenderness in physical examination, taking client medication) and in target setting and outcome (prevention of bowel dysfunction, stable water, and electrolyte status, client placement in types 3 and 4 of the Bristol criteria). All recommendations reached over 70% agreement in all four areas of the initial draft, and some care should be taken by stroke nurses or MSc of Critical Care Nursing. The findings of this study can be used for the management of new-onset constipation after stroke and can be used for developing national guidelines or developing the criteria.

Introduction

Stroke is the second leading cause of death worldwide [1]. The complications of a stroke in the early days of hospitalized patients significantly increase the mortality rate [2-4]. One of the most common complications of acute stroke is constipation. Constipation status and laxative use are independently associated with a higher risk of all-cause mortality and incident of stroke [5]. It has been reported to occur in 22.9%-79% of patients with stroke [6]. In the acute stage, the incidence of constipation ranged from 33% to 55% and was associated with poor stroke outcomes among clients with strokes of moderate severity at baseline [6, 7].

The risk factors for new-onset constipation and its impacts on acute stroke complications have remained unclear [8]. However, new-onset stroke constipation is secondary constipation due to several factors after cerebrovascular accidents. These factors include medication use (antidepressants, antiepileptics, antihistamines, antispasmodics, anticholinergics, calcium channel blockers, calcium and iron supplements), metabolic diseases (hypothyroidism, hypoparathyroidism, hypercalcemia, hypokalemia, hypomagnesemia, diabetes mellitus, uremia, and heavy metal poisoning), neuropathies (due to cerebrovascular disease, medullar lesions or neoplasia, multiple sclerosis, autonomic neuropathy, and Parkinson disease) and other conditions (cognitive impairment, immobility, Chagas disease) [9].

Constipation, as a distressing symptom, is traditionally managed by nurses. Ambiguity concerning the descriptions of the nurse's role in managing constipation exists, and guidelines are scarce. Management of constipation is typically based on experience and anecdotal evidence. There is a range of treatment modalities: diet modification, fluid intake, bowel training, abdominal massage, and increased mobility in older adults [10]. According to Fekri et al. study, the abdominal massage is in line with gastrointestinal peristalsis, confirming that a shallow abdominal massage might be the reason for the reduction of constipation improvement [11].

For constipation, little evidence is available to assist nurses in carrying out an appropriate clinical assessment, taking a proper treatment choice, or considering

all constipation factors in a structured care plan [12]. Given the high prevalence of constipation among stroke clients, its adverse effects, the nurse's responsibility, the lack of studies in this regard, it seems helpful to conduct a study that prioritizes and updates the role of nursing interventions in constipation after stroke. Therefore, we aimed to define a care plan for post-stroke constipation.

Materials and Methods

The current multi-stage evolutionary study elaborates the protocol study and method of Caspian Nursing Process Projects (CNP2), conducted in 2019 with the combination of Delphi and RAND (Research And Development) Methods (RAM) in Isfahan City, Iran. This project was used a scientific method to plan, collect, and implement a structural plan by nursing-led intervention for stroke complications such as new-onset constipation. This method was designed by the RAND Institute and the University of California in Los Angeles (UCLA). It has been used in many studies in North America and Europe. RAM involves generating clinical scenarios or criteria [13]. The research study consisted of several phases according to similar studies as follows:

1. Searching for scientific sources
2. formal-content validity
3. RAM and Delphi methods
4. Results and changes made at the Delphi stage
5. The panel of experts [14]

Searching for scientific sources

The inclusion criteria for scientific resources have two sections: first, searching for resources, and second, authorities who participated in the study. Clinical articles and guidelines on constipation management after stroke, available as English language full texts between January 2004 and December 2019, were extracted first. Also, the relevant authorities were selected with at least 5 years of experience in clinical practice, willingness to cooperate, and having sufficient time to collaborate in research. The exclusion criteria were unwillingness or lack of time to cooperate.

First, we systematically searched databases, such as Cochran database, MEDLINE, Science Direct, PubMed, Elsevier, Scopus, and library resources with keywords and MeSH terms, such as "post-stroke constipation", "constipation", "new-onset constipation" in combination with the "stroke" and "cerebrovascular accident" terms using OR & AND operators. Figure 1 shows the steps of research in the current study. Twenty-one articles from 2009 to 2019 were identified and selected after reviewing their titles and abstracts. In this process, we used Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline. In the next step, seven studies were excluded because of not meeting the inclusion criteria, and three studies were excluded because of not being written in English (1 article) and not having their full texts (2 articles). In the end, 11 articles were entered the study. Also, by systematically searching for the care plan at specialized sites such as the World Gastroenterology Organization (https://www.worldgastroenterology.org) [15], the American Gastroenterology Association (https://www.gastro.org) [16], and the British Institute of Health and Care Excellence (https: //www.nice.org.uk) [17] on the subject of constipation management, six guidelines were found. These guidelines were appraised by AGREE II (The Appraisal of Guidelines for Research & Evaluation), and three guidelines were passed. Finally, 14 articles and guidelines were included in the study (Table 1).

Formal-Content validity

First, initial recommendations were extracted from the articles and guidelines. During this step, the original text was translated into Persian, and references were written on the right-hand side of a table. Then, faculty members in the formal-content validity team (5 faculty members of the Isfahan University of Medical Science) were asked to modify, reject or approve the translation and determine the relative content to structure on the left side of the table.

RAM and Delphi methods

The RAM includes priority, benefits, applicability, conceptualization, and authorization to provide service [14]. A list of recommendations in the new-onset constipation care plan was compiled according to credible sources and articles, arranged by nursing process, and divided into four tables (assessment, goals and outcomes, nursing diagnosis, intervention, and evaluation). A total of 22 authorities from different professions 11 Nurses (50%), Neurologist (18.2%), 2 Fellowships of Intensive Care (9.1%), Internal Medicine (9.1%), Surgen 1 (4.5%), Nutrition (4.5%), and Emergency Medicine (4.5%) of Isfahan, Tehran and Babul universities of Medical Sciences, who were expert in constipation management after stroke were selected. Also, due to ethical

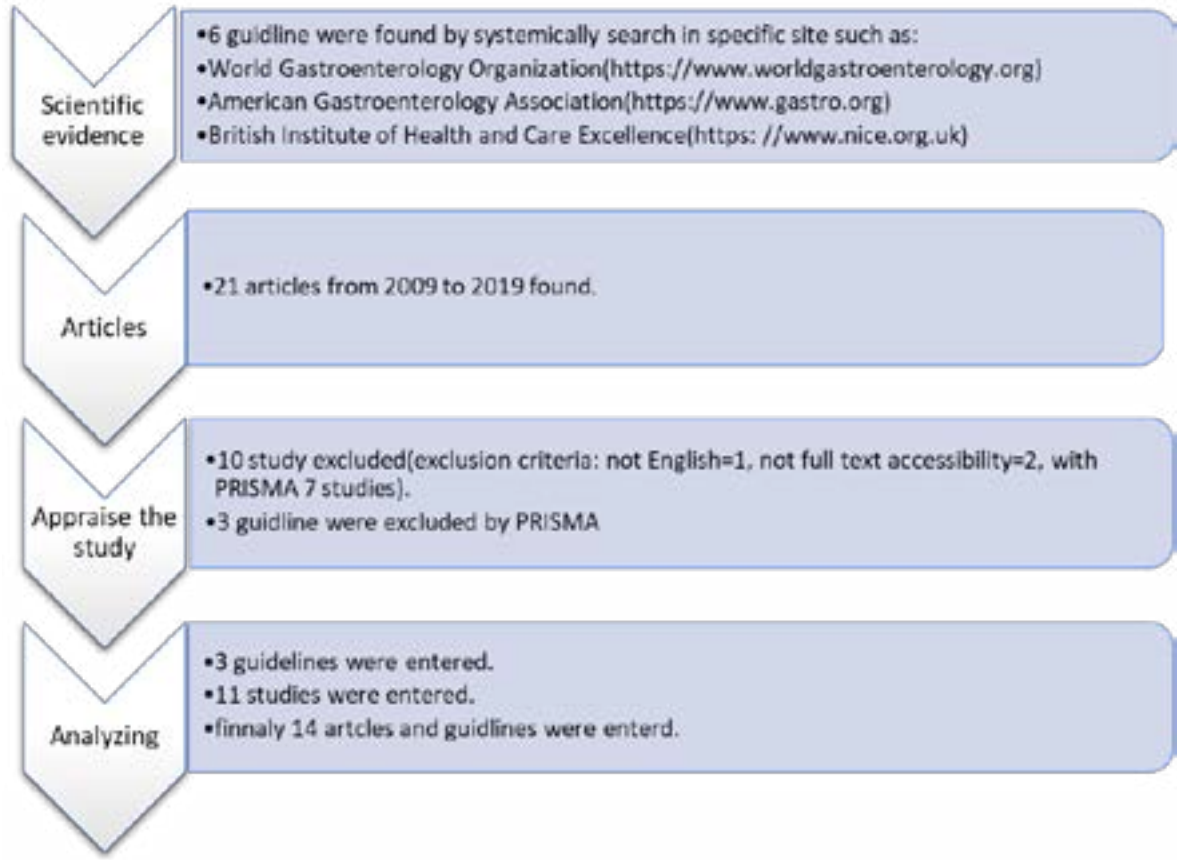

Figure 1. Steps of searching the literature for defining nursing care plan

considerations in the research, the participants were assured that all information was confidential and that the contributor's name and comments were provided only to the researcher. Based on the Delphi technique for obtaining expert' opinions, a written version of the clinical guideline was completed in person, delivered to the participants who had mentioned their readiness. They were asked to complete a 5-point Likert scale clinical guideline draft, and if required, note further care or advice in a proposal form. As the RAM technique, the rating was (1 to 5) applied in four domains (priority, benefits, applicability, and conceptualization) of each recommendation. Then they could comment on the recommendation in the relevant column.

The priority areas were determined on a 5-point Likert scale: score 1, in my opinion, this care is not necessary at all; score 2, I don't think this care is necessary; score 3, in my opinion, this care is relatively necessary; score 4, in my opinion, this care is necessary; and score 5, in my opinion, this care is absolutely necessary.

The applicability of each recommendation can be tailored to the hospital conditions and equipment, with a maximum score of 5 and a minimum of 1.

The conceptualization means whether this sentence is understood by the nurse; score 5 refers to the full understanding, vs score 1 that means not be understood. Finally, the experts were asked to identify eligible nurses in the program, including a BSc nurse, Stroke Nurse (SN), or Critical Care Nurse (CCN), who can provide services.

Results and changes made at the Delphi stage

In this stage, the results obtained from the experts and the services with 70% agreement and above were maintained in the project. The rest with less than 70% agreement was separated to prepare the subsequent questionnaire and comments and suggestions by some professors and users in writing. According to the experts' opinions, those services with less than 50% agreement were not suggested.

The panel of experts

In this stage, each item in care plan which not acquired agreement upper than 70% according to authorities opinion, should be discussed and finally modified or removed from care plan.

Table 1. Articles included in the current study after appraising

Authors	Year	Conclusions
Lim et al. [26]	2016	New-onset constipation is common among patients admitted for stroke and orthopedic conditions during acute hospitalization. The early occurrence, on day 2 of admission, calls for prompt preventive intervention for constipation.
Theofanidis & Gibbon [27]	2016	For over 20 years, it has been established that specialized stroke care can save lives, reduce disability, shorten the length of hospitalization, and generally is associated with improved patient outcomes. Highly specialized nursing input is paramount in achieving optimal patient outcomes and high quality of interdisciplinary care, providing a comprehensive, interactive, and holistic approach for acute stroke and rehabilitation.
Kosasih & Solehati [28]	2018	Nurses and other health care team members should consider the needs of each dietary fiber and fluids; they should also be trained in stroke patient exercise regularly.
de M Engler et al. [29]	2014	Bowel dysfunctions increase significantly after stroke. Therefore, further studies are needed to better understand and characterize such dysfunctions, which are scarcely described in the literature.
Iovino et al. [30]	2013	Results provide evidence that prolonged physical inactivity is a relevant etiology in functional constipation in healthy individuals. The typical clinical suggestion of early mobilization in bedridden patients is supported as well.
Park et al. [31]	2012	These guidelines are expected to reflect the current situation regarding the treatment of constipation in Korea. In this paper, practical constipation treatment methods in current use will be reviewed with reference to these recent guidelines.
Lindberg et al. [15]	2011	The Bristol stool form scale: a measure to assist patients in reporting on stool consistency. Dietary modification may consist of a high-fiber diet (25 g of fiber), and fluid supplementation (up to 1.5–2.0 L/d) may improve stool frequency and decrease the need for laxatives.
Lamas et al. [32]	2009	Abdominal massage decreased the severity of gastrointestinal symptoms, especially constipation and abdominal pain syndrome, and increased bowel movements. The massage did not lead to a decrease in laxative intake, a result that indicates that abdominal massage could be a complement to laxatives rather than a substitute.
Su et al. [33]	2009	New-onset constipation is a common complication of acute stroke. Its occurrence is associated with dependence and the use of bedpan for defecation. Its development may predict a poor outcome at 12 weeks in patients with moderately severe stroke.
Ginsberg et al. [34]	2007	Identifying the underlying causes of constipation is essential to initiate appropriate treatment. Secondary causes of constipation can be best managed by correcting the underlying causes and predisposing factors, ally resolvable with sequential adjustments of diet, patient education and training, and laxative use only as necessary. Some refractory cases may warrant
Harari et al. [35]	2004	A single clinical/educational nurse intervention in stroke patients effectively improved bowel dysfunction symptoms up to 6 months later, changed bowel-modifying lifestyle behaviors up to 12 months later, and influenced patient-physician interaction and physician prescribing patterns.

The experts' opinions in each column and degrees of the agreement were analyzed on a 5-point Likert scale for each item using descriptive statistics in Excel in Microsoft Office 2019 and SPSS v. 23 software.

Results

The current study results showed that all 22 experts provided their feedback comments in a written format; in other words, we had 100% participation by experts. Most of them were 16 men (72.7%), 15 cases (68.2%) had a PhD, and the highest profession belonged to Nursing with 11 cases (50%). All recommendations had reached over 70% agreement in all four areas of the initial draft (priority, benefits, applicability, and conceptualization). After that, the initial draft was revised and confirmed by experts; because of high agreement, the panel phase of experts was not held.

Data by RAM technique was categorized in priority, benefits, applicability, and conceptualization items. Regarding the priority, the highest agreement was found on patient and companion education (98%) and the lowest on disability in daily activity (75.6%). In terms of benefits, the patient's education again achieved the highest agreement with 97.2% and use of the Bartel index (an ordinal scale used to measure performance in activities of daily living in approximately three weeks that could predict activities of daily living disabilities in 6 months) [18] with 73.6%, obtained the lowest agree-

Table 2. RAM technique in the assessment of new-onset constipation

Assessment Recommendations	%				Nurses Allowed to Provide Services*, No. (%)		
	Priority	Benefit	Applicability	Conceptualization	BSc	SN	CCN
In assessing clients with constipation following stroke, standard criteria such as Rome IV can be used without time requirement.	80.8	84.4	77.2	80.8	11(50)	16(72.7)	18(81.8)
The risk of new-onset constipation can be measured by the standard Norgine tool.	76.8	86.2	83	83	7(31.8)	15(68.2)	18(81.8)
Use the Bristol scale to check for stool consistency.	81	91	87	87	12(60)	21(95.5)	14(70)
Types 1 and 2 of Bristol scale should be considered as constipation.	82	91	91	93	12(54.5)	16(80)	17(77.3)
In the client's history, weight loss, anal bleeding, and iron deficiency anemia should be considered.	87.2	83.6	76.2	84.4	16(80)	16(72.7)	20(90.9)
The client's history should include depression, a low-calorie intake, low education, low income, number of medications received, inactivity, age, and gender of the client.	87.2	86.2	91.8	90	16(72.7)	16(72.7)	20(90.9)
In the client's history, consider the amount of fluid, fiber, the medical or surgical, and previously associated factors, such as diabetes and hypothyroidism.	87.2	86.2	84.4	87.2	16(72.7)	17(77.3)	15(68.2)
Physical examination of the abdomen in constipation is non-tenderness but with distension or discomfort in the palate.	86.2	88	83.6	82.6	10(45.5)	17(77.3)	14(63.6)
The client's medications should be considered to identify an increased risk of constipation.	96.2	93.6	85.4	89	9(40.9)	15(68.2)	14(63.6)
The ability of the client to function in relation to movement, eating, and drinking must be identified.	86.2	89	81.8	87.2	14(63.6)	19(86.4)	18(81.8)
Multiple medications and their side effects should be considered.	81.8	81.8	72.6	75.4	11(50)	10(45.5)	18(81.8)
Post-stroke constipation can be defined as symptoms like difficulty with defecation with or without pain which was not before the stroke.	91.8	86.2	83.6	89	12(54.5)	19(86.4)	18(81.8)
Constipation refers to having two or fewer defecations per week with complaints of no excretion, difficulty in defecation, or strain.	89	82.6	80.8	79	20(90.9)	19(86.4)	15(68.2)
In stroke clients who were admitted to intensive care units and unable to respond, the definition of constipation is considered defecation twice or less per week.	88	84.4	88	87.2	19(86.4)	16(72.7)	14(63.6)

* BSc: Bachelor in Nursing; SN: Stroke Nursing; CCN: Critical Care Nursing.

Table 3. Goals and outcomes in new-onset constipation based on ram technique

Recommendations for Setting Goals and Outcomes	%				Nurses Allowed to Provide Services*, No. (%)		
	Priority	Benefits	Applicability	Conceptualization	BSc	SN	CCN
Prevention of bowel dysfunction	93.6	92.6	80	73.6	7(31.8)	18(81.8)	18(81.8)
Increasing awareness about bowel caring	88.4	89.4	83	85.2	11(57.9)	16(72.7)	15(78.9)
The stable state of water and electrolyte	94.6	93.6	80	80	9(40.9)	17(77.3)	18(81.8)
Placing the patient in type 3 or 4 Bristol scale	83.4	94	85.8	90.4	8(36.4)	15(68.2)	17(77.3)
No evidence of constipation according to Rome IV criteria	90.4	88.2	85.8	89.4	7(31.8)	18(81.8)	17(77.3)

*BSc:Bachelor in Nursing: SN: Stroke Nursing: CCN: Critical Care Nursing.

ment. In the applicability area, reporting the water and electrolyte impairment and an educational booklet with 93.6% agreement got the highest, and performing exercises such as pelvic lifting got the least applicability with 70%. Also, in terms of conceptualization, reporting water and electrolyte impairment obtained the highest agreement. On the other hand, the initiation of the constipation management protocol and prevention of bowel dysfunction received the least attention from the experts.

Considering the nursing process, according to each step, the recommendation was defined. According to experts' opinions, people who provide services with less than 50% agreement were BSc nurses, so it was suggested that this care should be taken by stroke nurses or MSc in Critical Care Nursing (CCN). In the assessment section, the highest percentages of agreement belonged to constipation diagnosis by IV Rome criteria, constipation risk by the Norgine instrument, tenderness in physical examination, taking client medication (Table 2). Regarding goal setting and outcome, the highest percentages of the agreements were seen in the prevention of bowel dysfunction, stable water and electrolyte status, client placement in types III and IV of the Bristol criteria (The Bristol stool scale is a diagnostic medical tool designed to classify the form of human feces into seven categories, which is used in both clinical and experimental fields) [19], and no evidence of constipation according to the Rome IV criteria (Table 3). Regarding nursing diagnosis and intervention, the highest percentages of agreements belonged to initiating constipation management protocol, identifying patterns of excretion, fiber intake, adjusting the patient physical activity, walking, pursuing constipation remedies, laxative use, training manual and educational booklet and pamphlet (Table 4). About evaluation, the highest degree of agreement belonged to evaluating the client's response to interventions, the level of awareness of intestinal care, evaluation of care performed, and using the Barthel index (Table 5).

Discussion

Stroke and its complications, such as constipation, can lead to mortality and disability [20, 21]. For the management of constipation, scientific methods, such as formal consensus development (including RAM), provide a timely and efficient solution when evidence is insufficient [22]. We used RAM for the management of new-onset constipation after stroke. All recommendations had reached over 70% agreement in all four areas of the initial draft.

Regarding the RAM sections, the highest agreement was found on the patient's and companion's education, reporting the water and electrolyte impairment and educational booklet. On the other hand, disability in daily activity, use of Barthel index, performing exercises, such as pelvic lifting, initiation of the constipation management protocol, and prevention of bowel dysfunction acquired the lower agreement in each item. According to the Farouki Far et al. study, patient education is one of the quality standards of nursing care and affects the costs, recovery, and cure rate of the patients [23]. Nurses know that immobilization, inadequate intake of water and fiber, emotional disturbance, reduced consciousness, and side effects of medication are the factors that contribute to constipation in stroke clients [24]. So, they should be enrolled in the patient education programs. As nurses are always the first line of dealing with the stroke patients in the hospital [11], they should implement interventions, such as patient and companion education, reporting the water and electrolyte impairment, and educational booklet to alleviate the patient's constipation and gastrointestinal complications.

Table 4. Nursing diagnosis and interventions in new-onset constipation based on ram technique

Recommendations for Nursing Interventions		%				Nurses Allowed to Provide Services*, No. (%)		
		Priority	Benefits	Applicability	Conceptualization	BSc	SN	CCN
New-Onset constipation associated with water and electrolyte disorder	Start constipation management protocol, identify excretion pattern, amount, and volume of fluid received	76.2	80	72.6	73.6	6(27.3)	18(81.8)	18(81.8)
	1.5 to 2 L fluid intake depending on patient's condition	79	85.4	75.4	82.6	11(50)	15(68.2)	15(68.2)
	Record and report any water and electrolyte disturbance to the physician	90.8	95.4	93.6	96.2	20(90.9)	15(68.2)	15(68.2)
New-Onset constipation associated with inadequate fiber intake	Initial remedies for constipation with diet modifications include fiber and fluid	84.4	83.6	74.4	79	16(72.7)	14(63.6)	18(81.8)
	Get fiber between 25 and 30 g/d. Fiber intake should be increased gradually, and the client should receive at least 1.5 L of fluid within 24 hours.	86.2	87.2	75.4	80.8	7(31.8)	19(86.4)	18(81.8)
	Short-term use of laxatives is suggested as a second line of treatment.	80.8	75.4	70.8	80	15(68.2)	15(68.2)	13(59.1)
New-Onset constipation associated with immobilization	Physical activity should be adjusted based on patient tolerance, health conditions, and compliance.	84.4	89	75.4	85.4	7(31.8)	11(50)	16(72.7)
	Walking for 20 minutes once or twice a day is recommended for clients with impaired mobility.	85.4	87.2	77.2	83.6	7(31.8)	16(72.7)	18(81.8)
	For clients with bedridden or disabilities, exercises such as hip or leg lifting are suggested.	81.8	80	70	80	11(50)	11(50)	14(63.6)
New-Onset constipation associated with taking multiple medications	Modify the patient's medication and consider constipation as a side effect	84.2	91.4	78.8	81	13(59.1)	14(63.6)	14(63.6)
	Report constipation after prescribing medication to physician.	92.6	90.8	90.8	82.6	11(50)	16(72.7)	14(63.6)
	Proper drug use	90	90	82.6	83.6	8(36.4)	17(77.3)	14(63.6)
New-Onset constipation due to drug side effects	Modify the patient's medication and consider constipation as a side effect.	83.6	85.4	71.8	78	7(31.8)	14(63.6)	16(72.7)
	Start constipation management protocol, identify elimination patterns, amount, and volume of fluids received.	92.6	91.4	84.2	84.2	7(31.8)	14(63.6)	18(81.8)
	Proper drug use	89	92.6	90.8	88	11(50)	17(77.3)	18(81.8)

Recommendations for Nursing Interventions		%				Nurses Allowed to Provide Services*, No. (%)		
		Priority	Benefits	Applicability	Conceptualization	BSc	SN	CCN
New-Onset constipation associated with nerve damage	Start the constipation management protocol, identify elimination pattern, amount, and volume of fluid received.	90.4	93.6	88.4	87.2	4(18.2)	15(68.2)	18(81.8)
	Massage daily for 10 minutes on a colonic area with gentle movements.	86.2	80	74.4	80.8	11(50)	12(54.5)	18(81.8)
	Short-term use of laxatives is recommended as a second line of treatment.	80	76.2	77.2	80.8	7(31.8)	17(77.3)	18(81.8)
New-Onset constipation associated with knowledge deficiency	Patient and companion educations on constipation management	98	97.2	87.2	89	10(45.5)	16(72.7)	18(81.8)
	Compilation of training booklet	89	91.8	93.6	91.8	9(40.9)	17(77.3)	17(77.3)
	Compilation of educational pamphlet	91.6	92.6	91.4	92.6	6(27.3)	16(72.7)	18(81.8)

* BSc: Bachelor in Nursing; SN: Stroke Nursing; CCN: Critical Care Nursing.

Fekri et al. reported that massage and lifestyle training could improve constipation and distension and reduce patients' need for taking laxative drugs. However, abdominal massage is a simple and inexpensive procedure, and anyone can be trained to do it [11]. Meta-analysis results imply that massage therapy could be a beneficial complementary treatment for a patient suffering constipation after stroke [25]. Lifestyle training, such as consuming fiber-containing foods, movement, and activity, could significantly improve gastrointestinal complications [11].

Considering that less than 50% agreement is being reached with the BSc nursing in some items, it was suggested that this care be taken by stroke nurses or MSc in CCN.

Conclusion

Table 5. Evaluation in new-onset constipation based on ram technique

Recommendations for Evaluation	%				Nurses Allowed to Provide Services*, No. (%)		
	Priority	Benefits	Applicability	Conceptualization	BSc	SN	CCN
Evaluating the client response and the need for ongoing interventions	91.6	83.6	82.4	85.8	4(21.1)	11(57.9)	18(94.7)
Evaluating the level of awareness of intestinal care	89	89.4	80	84	7(36.8)	14(73.7)	18(94.7)
Bristol should be ranked types 3 and 4 to evaluate the care provided by the patient's fecal consistency.	82	80	82	84.2	13(68.4)	15(78.9)	17(89.5)
Patient care must be free of constipation according to Roman criteria IV (unconditional).	87.2	85.2	76.8	84.2	9(47.4)	15(78.9)	17(89.5)
The Barthel index should be used for disability in daily activities.	75.6	73.6	77.8	77.8	5(26.3)	15(78.9)	17(89.5)

* BSc: Bachelor in Nursing; SN: Stroke Nursing; CCN: Critical Care Nursing.

Our results indicated that all recommendations had reached over 70% agreement in all four areas of the initial draft, but some care should be taken by a stroke nurse or MSc in CCN. The study findings can be used for the management of new-onset constipation after stroke. The study results can be used for developing national guidelines or criteria for this problem. This study had some limitations. We could not access other centers to invite other authorities in this field to increase the quality. Also, this study was limited to Iran, which focuses on new-onset constipation management with the structural and scientific method.

Ethical Considerations

Compliance with ethical guidelines

The proposal of this study was approved by The Vice-Chancellor in Research and the Ethics Committee of Isfahan University of Medical Science (Code: IR.MUI.RESEARCH.REC.2018.320). Cooperation in this research was not obligatory, and the purpose of the study was explained to all participants.

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Author's contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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