Original Article

Caspian Nursing Process: Impactions on New-Onset Constipations in Admission, Discharge, and Follow-up of Acute Stroke Patients

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Abstract

Background: Structural planning is essential for the management of constipation in stroke patients. The current study aims to determine the impact of a care plan on the frequency of new-onset constipation following stroke. **Materials and Methods:** This clinical trial was conducted on 132 stroke patients (two groups of 66) in three phases (pre-intervention, during discharge, 1 month after discharge). Clients were randomly assigned to blocks based on gender, type of stroke, and age. The care plan according to the nursing process was conducted. Data collection tools included a demographic–clinical information questionnaire, Rome IV criteria (diagnosis of constipation), and Bristol scale (consistency of stool). Data were analyzed using the Chi-square, McNemar, Wilcoxon, Analysis of Variance (ANOVA), and a general estimated model. **Results:** The prevalence of new-onset constipation following stroke in the control group decreased from 66 (100%) at admission to 39 (67.20%) at discharge and in the intervention group from 66 cases (100%) to 18 cases (34%) (p = 0.001), but it was not significant at follow-up (p = 0.16). The trend of frequency of constipation from admission to follow-up was generally significant in the intervention group (p = 0.03) vs the control group (p = 0.21). The difference in the mean number of cases of constipation was statistically significant (2.89) 2.10) control group vs 1.58 (1.65) intervention group, p < 0.001). **Conclusions:** A significant impact of the care plan was observed from admission to discharge, but further follow-up was required with more client-side collaboration. Therefore, the present care plan is recommended in the hospital and home care.

Keywords: *Constipation, neuroscience nursing, nursing care, patient care planning, stroke*

Introduction

Stroke is the second leading cause of death worldwide.[1-3] Complications of stroke are a major cause of death in the acute and subacute phases and can persist in survivors many years after the events.[4,5] Brain injuries, particularly due to stroke, have been well established as a cause of gastrointestinal disorders and manifested as alterations in bowel function such as constipation of varying severity.[6] First, cerebral injury can lead to an interruption of the axis between the central nervous and gastrointestinal systems. Disordered gastrointestinal emptying and abnormal bowel motility result in constipation.[4] Second, physical mobility, fluid intake, and fiber intake are reduced due to a variety of reasons, including difficulty in swallowing. Third, dependence on others to use the toilet may also lead to constipation. Fourth, the use of several medications such as dehydrating agents also affects bowel function.[7]

There is a lack of a consensus on various symptom-based definitions of constipation, which include fewer than three bowel movements per week, difficulty with defecation, or a sense of incomplete evacuation.[5] The prevalence of constipation after stroke is 30% to 60%. New-onset constipation is seen in 55% of patients within a month after the first stroke[8] and is associated with increased length of hospital stay, poor neurological outcome, development of further complications, and even death.[4]

Treatment strategies include non-pharmacological approaches (diet modification,[9] fluid intake, bowel training, abdominal massage, and increased mobility) and pharmacological therapies (fiber supplements and laxatives) based

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on nursing interventions.[10] Nurses involved in patient care,[11] members of the rehabilitation team,[12] patient's education,[13] and nurse–patient relationships can speed up the patient recovery process.[5] Alijanpour *et al*.[14] in their study mentioned that the active involvement of nurses in the management and prevention of health conditions such as constipation merits further investigation for patient assessment, planning and implementation of structured bowel management interventions, and individualized education programs. Wang *et al*. in their meta-analysis study expressed that nursing interventions such as massage can be effective. In Wang *et al*.[15] study, on the second and third days, the incidence of defecation in the massage group was significantly higher than that in the control group. Currently, constipation receives very less attention in studies. Furthermore, the development of future studies should adopt a universally agreed definition of bowel dysfunction and validated intervention protocols and education programs.[16] This study was conducted to bridge the gap created due to non-uniformity in the definition of constipation, and limited study in new-onset constipation and nursing role in bowel care. The aims of this study were to (a) determine the impact of the Caspian nursing process on new-onset constipation after stroke in three phases (admission, discharge, and follow-up); (b) evaluate the nursing education role played by social messengers, booklets, and multimedia data; and (c) identify the factors that are associated with new-onset constipation after stroke.

Materials and Methods

This randomized clinical trial is the third stage of Caspian Nursing Process Projects (CNP2), which was a dissertation for the master's degree of critical care nursing. The first stage was protocol study,[14] the second stage was defining a care plan,[16] and the third was impaction of this care plan. All stroke patients admitted to the stroke care unit (4 active beds) and internal neurology ward (35 active beds) of Al-Zahra Hospital affiliated to Isfahan University of Medical Sciences, Isfahan, Iran, who met the inclusion criteria, from January 1, 2018 to December 30, 2018 were enrolled. Reasons for choosing this center include its comprehensive care strategies for acute stroke patients from Isfahan province and other nearby provinces through fellowship in intensive care and neuro-intervention. The study was enrolled in the Iranian Registry of Clinical Trials (IRCT) under the ID IRCT20181008041273N1.

Inclusion criteria for patients include examined and confirmed cases of illness by a neurologist, constipation according to Rome IV criteria, non-participation in any other study at the same time, permission from the treating physician for the patient's participation in this study, and patients being over 18 years old and under 90 years old and hospitalized for at least 1 week after a stroke. Patients should have no history of chronic constipation before the stroke for which the patient was referred to a physician or had received laxative, no history of malignant tumors and colon diseases such as irritable bowel, etc., based on the patient's self-report and record, and should not have water and electrolyte disorders due to kidney disease.

Exclusion criteria include expiry during research, need for abdominal or bowel surgery, diagnosis of colon disease (irritable bowel), malignant tumor found during the study, and the patient's non-compliance with the training provided by the treatment team and the instruction booklet. Sample size, based on the type of study, similar articles, and consultation with statistics experts was determined. The sample size at the confidence level of 95% and power factor of 80% was determined to be 120 persons in both groups and with considering a percentage of fallout then increased to 132 patients (66 to control group vs 66 to intervention group). Sampling was done by the census method for 1 year. Then patients were blocked randomly into eight blocks using the randomization software based on admission time. The blocks were stroke type (ischemic, hemorrhagic), age, and gender (male and female) [Figure 1].

The patient's history, neurological examination, and neuroimaging studies were recorded in the questionnaire by interviewing with patients or their companion or patient records. Definition of stroke and subtype was conducted by neurologist visit as same as the previous study.[2] Data collection tools included a demographic–clinical information questionnaire, Rome IV criteria, and Bristol scale.

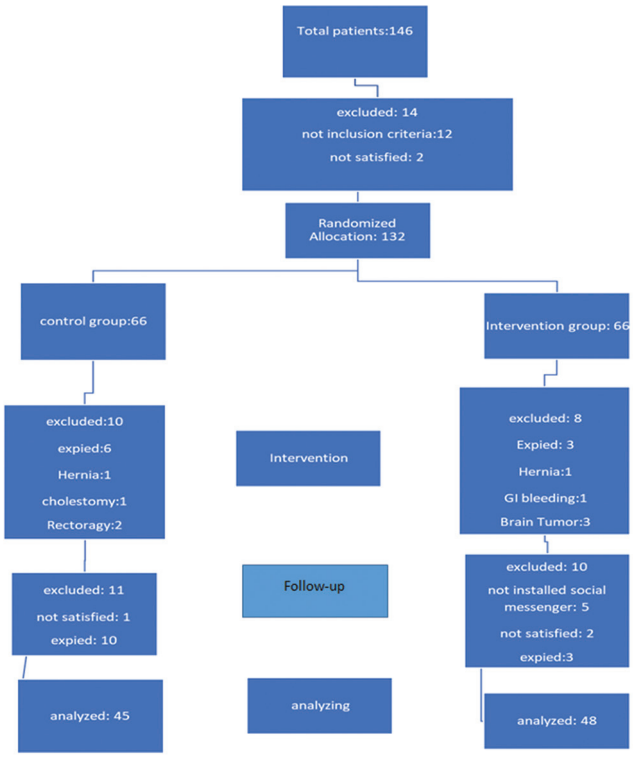

Figure 1: CONSORT flow diagram

The demographic–clinical information questionnaire included two parts. First was demographic information which includes age (elderly: more than 60 years old and adult: 18–59 years old) and Body Mass Index (BMI) (low weight (18.50–24.90), normal (25–29.9), and weight (30 or higher)). Drug history (yes or no and name of drugs), alcohol intake (never, ex-drinker, or current drinker), smoking (yes or no), depressive symptoms (yes or no), and physical activity (disable, enable with help, enable) were recorded. For residential status, since the geographical area has been reported to be associated with constipation and risk of cardiovascular disease, we defined cities in Iran (population ≥50 000) as urban areas and towns or villages (population <50 000) as rural areas.

The second was the clinical characteristics of patients, recorded in three phases. During admission, data such as medical history, duration, medications, type of stroke, fluid intake within 24 h, fiber intake, and physical examination information (hearing, touch, prick) were recorded. Also, at discharge, data related to the duration of mechanical ventilation, length of hospitalization, and type of medication used during hospitalization (especially nitrates, calcium antagonists, cardiac glycosides, antidepressants, seizures, thrombolytic), and, then 1 month after discharge, data related to complications after discharge, medications used, readmission and its cause, frequency of stool discharge, and its consistency were recorded. To diagnose new-onset constipation, we used the Rome IV criteria because of its worldwide acceptance as a standard in research and lack of a specific instrument.[17] Constipation was defined based on general and specific criteria. (A) General criteria: problems in 25% defecation, insufficient evidence of irritable bowel syndrome, and no stools or rarely loose stool. (B) Specific criteria: straining, hard or heavy stools, incomplete discharge, anorectal obstruction or closure, manual or digital maneuvers to facilitate excretion, and fewer than three spontaneous bowel movements per week. In the current study, according to the expert opinion, priority 80.8%, beneficial 84.4%, applicability 77.2%, and conceptualization 80.8% were concluded according to RAND Appropriateness Method (RAM) methods. Also, it was recommended (81.8%) that the criteria should be assessed by the nurses who had master's degree in critical care.

Bristol scale was used to assess stool consistency. It is a 7-point Likert scale. Type 1: Separate hard lumps, like nuts; Type 2: sausage-shaped but lumpy; Type 3: like sausage but with cracks on its surface; Type 4: like sausage or snake, smooth and soft; Type 5: Soft blobs with a clear-cut edge (passed easily); Type 6: fluffy pieces with ragged edges, a mushy stool; and Type 7: watery, no solid parts, entirely liquid. Types 1 and 2 were categorized as constipation; 3 and 4 natural; and 5, 6, and 7 diarrhea. The validity of the scale was also confirmed by.and which is used by Alijanpour *et al*.[14] study in Iran. Eighty-one percent priority, 91% beneficial, 87% applicability, and 87% conceptualization were obtained. Also, according to the authority opinion (95.50%), it is recommended that nurses use this tool for stroke.

We used a care plan which is defined by "Caspian nursing process projects" according to the mix of RAM and Delphi methods.[14] It includes different parts according to the nursing process. Nursing interventions generally include water-electrolyte correction, medication regime, fiber therapy, massage therapy, patient education, and follow-up. For modifying drug regime: drugs that lead to constipation were replaced by a neurologist if appropriate. For diet**:** hot vegetables or a salad with at least one meal daily were given. Furthermore, for fiber therapy: 20 to 35 grams per day (g/d) which is taken by a mix of whole wheat bread, unrefined cereals, citrus fruits, and vegetables. For abdominal massage therapy: according to Alijanpour *et al*.[16] study, performed for 10 min twice a day with gentle and rotational movement according to the colon direction. Also, for patients training: at the time of discharge, a booklet and pamphlets on constipation following stroke based on self-care and self-efficacy are given to the clients. At last in client's follow-up: clients followed up for 1 month after discharge. This phase consisted of two parts: communicating with the treatment team by social messenger (WhatsApp) and evaluating the impact of training and counseling by Rome IV and Bristol scale.

This care plan was followed in the intervention group from admission to discharge. All statistical analyses were performed using SPSS (version 25; SPSS Inc., Chicago, IL, USA) with the level confidence of 0.05. We used the Chi-square, McNemar, Wilcoxon, and analysis of variance (ANOVA) tests, and the general estimation model to compare variables before and after the intervention within groups.

Ethical considerations

This study was approved by the Ethics Committee of Isfahan University of Medical Sciences (IR.MUI.RESEARCH.REC.1397.320). The researcher obtained the necessary authorization by obtaining written consent from the Isfahan School of Nursing and Midwifery. The study units had the option of either participating or not in the research and then informed written consent was obtained. The research findings were shared with the participants if requested. The research units were also assured that the personal information and contents of their questionnaire would be kept confidential by the researcher.

Results

Of 132 patients enrolled for the current study, 93 patients were retained based on exclusion criteria after a 1-month follow-up. The mean age in the control group was 64.50 (12.80) years and in the intervention group, it was 64.02[16] years. Out of 57 male patients, 27 cases (47.4%)

were in the control group and 30 cases (52.60%) were matched to the intervention group; and out of 36 female patients, 18 cases (50%) were in the control group and 18 cases (50%) were matched to the intervention group. Of the 93 stroke clients studied, 45 (48.40%) were ischemic, 21 (46.70%) were in the control group, 24 (53.30%) were in the intervention group, and 48 (51.60%) were hemorrhagic: 24 (50%) were in the control group vs 24 (50%) in the intervention group. There was no significant difference in mean age, height, weight, and BMI between the two groups ($p > 0.05$). The demographic characteristics of clients are shown in Table 1.

The mean weight in the intervention group was higher, but the mean BMI was either lower in the intervention group or the normal range ($p < 0.05$). The most chief complaints (38.70%) were headache (18 cases (40%) in the control group vs 18 cases (37.50%) in the intervention group ($p = 0.90$)). A total of 29 cases (64.50%) in the control group and 23 cases (47.90%) in the intervention

Table 1: Demographic characteristics of new-onset constipation in stroke patients

Variable	Category	Control	Intervention	*p*
Height	-	156.56 (34.81)*	170.47 (8.22)	0.06***
Weight		68.56 (17.45)*	73.54 (14.03)	0.29
Body mass index		25.79 (3.98)*	24.50 (3.90)	0.30
Age	Mean	64.50 (12.80)*	64.02 (16)	0.86
	Adult	12 (26.70)**	15 (31.30)	0.65***
	Elderly	33 (73.30)**	33 (68.70)	
Residential status	Urban	32 (71.10)**	31 (64.60)	0.51
	Rural	13 (28.90)**	17 (35.40)	
Degree	Under diploma	18 (40.60)**	20 (41.70)	0.59
	Diploma	26 (57.80)**	25 (52.10)	
	Bachelor	1 (2.20)**	3 (6.30)	
Insurance	Non	38 (84.70)**	42 (87.50)	0.76
	Yes	7 (15.60)**	6 (12.50)	
Marriage	Married	35 (77.80)**	35 (72.90)	0.63
	Widowed	10 (22.20)**	13 (27.10)	
Job	Home keeper	14 (31.10)**	15 (31.30)	
	Retired	8 (17.80)**	11 (22.90)	0.38
	Unemployed	7 (15.60)**	9 (18.80)	
	Employee	3 (6.70)**	6 (12.50)	
	Worker	13 (28.90)**	6 (12.50)	
	Farmer	0 (0)**	1 (2.10)	
Department	Stroke care	20 (44.40)**	20 (41.70)	0.83
	Internal neuro	25 (55.60)**	28 (58.30)	
Admission type	Emergency Medical Service	12 (26.70)**	10 (20.80)	0.62
	Other centers	21 (46.70)**	21 (43.80)	
	Personally	12 (26.70)**	17 (35.40)	
Hemorrhagic	SAH *****	12 (26.70)**	15 (31.30)	
	ICH	12 (26.70)**	10 (20.80)	0.73
Ischemic	Thrombotic	10 (22.20)**	14 (29.20)	
	Embolic	11 (24.40)**	9 (18.80)	
Chief complaints	Headache	18 (40)**	18 (37.50)	
	Loss of conscious	13 (28.90)**	10 (20.80)	
	Aphasia	7 (15.60)**	9 (18.80)	0.90
	Paresthesia	3 (6.70)**	4 (8.30)	
	Hemiplegia	2 (4.40)**	4 (8.30)	
	Vertigo	2 (4.40)**	3 (6.30)	
Enteral nutrition method	NG	29 (64.50)**	23 (47.90)	
	Oral	10 (22.20)**	21 (43.80)	0.08
	OG	6 (13.30)**	4 (8.30)	
Laxative	Ordered	26 (57.80)**	32 (66.70)	
	Not-ordered	19 (42.20)**	16 (33.30)	0.40

*Data were shown as mean (SD). **Data were shown as *n*(%), *** Data was analyzed by T test, *****SAH: Subarachnoid hemorrahge, ICH: Intracerberall hemorrahge, NG: Nasogasterial, Og: Orogasterial

group received nasal tube feeding (p = 0.08). According to the results, 26 cases (57.80%) in the control group and 32 cases (66.70%) in the intervention group received laxatives during the period of hospitalization (p = 0.40). Most of the subjects-14 cases (37.80%) in the control group vs 23 in the intervention group (62.60%)-had two Rome IV criteria fulfilled at admission (p = 0.24).

As shown in Table 2, most cases had no symptom of constipation according to Rome IV criteria at discharge (11 cases (42.30%) in the control group vs 15 cases (57.70%) in the intervention group (p = 0.08)). On the other hand, most patients had two symptoms at follow-up and three cases (100%) in the control group had all constipation symptoms, whereas none in the intervention group had all six symptoms at the same time. So, there was a significant difference in the number of symptoms between the two groups according to Rome IV criteria at discharge (p = 0.01).

In the intervention group, the frequency of constipation decreased from 66 cases (100%) to 18 cases (34%), which was significant (p = 0.001). Also, in the control group, the frequency of constipation decreased from 66 cases (100%) to 39 cases (67.20%), which was significant (p = 0.001). So, the difference between the two groups was statistically significant (p = 0.001). At follow-up, constipation was found in 59% of patients in the intervention group vs 75% in the control group (p = 0.16). The trend of changes in the intervention group from admission to follow-up was significant (p = 0.03), but this change was not significant in the control group (p = 0.21). Furthermore, according to the one-way ANOVA test, the mean number of symptoms according to Rome IV criteria after the intervention was 2.89 (2.10) in the control group and 1.58 (1.65) in the intervention group (p = 0001) [Table 3]. Figure 2 shows the trend of changes in the mean number of Rome IV symptoms in the two study groups at the time of admission, discharge, and follow-up.

Discussion

The current study aimed at evaluating the impact of the Caspian nursing process on new-onset constipation after stroke in three phases (admission, discharge, and follow-up). The demographic characteristics were not significantly different between the two groups. In the Lin *et al*.[18] study, the mean age of patients was 60.3 years, 94 (60.60%) were males, and 124 (80%) were ischemic stroke patients. Although in the general population age and sex were predictors of constipation, there was no correlation of constipation following stroke with age/sex. The results of the study by Su *et al*.[19] showed that type of stroke did not have any correlation with the incidence of early constipation

Table 2: Distribution of frequency of Rome IV symptom in stroke patients according to admission, discharge, and follow-up

Symptom number	Control	Admission	Control	Discharge	Control	Follow-up
		Intervention		Intervention		Intervention
0	-	-	11 (42.30)	15 (57.70)	9 (42.90)	12 (57.10)
1	-	-	7 (28)	18 (72)	3 (18.80)	13 (81.20)
2	14 (37.80)	23 (62.20)	7 (58.30)	5 (41.70)	12 (50)	12 (50)
3	10 (45.50)	12 (54.50)	1 (100)	0 (0)	5 (50)	5 (50)
4	13 (59.10)	9 (40.90)	2 (100)	0 (0)	12 (80)	3 (20)
5	6 (60)	4 (40)	5 (62.50)	3 (37.50)	1 (25)	3 (75)
6	2 (100)	0 (0)	6 (85.70)	1 (14.30)	3 (100)	0 (0)
p	0.24		0.08		0.01	

Table 3: Distribution of frequency of new-onset constipation and mean of Rome IV symptom in control and intervention groups according to admission, discharge, and follow-up time

Items	Group	Admission	Discharge	Follow-up	*p*
Diagnosis of constipation	Control	66 (100)*	18 (34)	33 (75)	0.21
	Intervention	66 (100)	39 (67.20)	23 (59)	0.03
	p	-	0.001	0.16	
Mean of Rome IV symptom	Control	3.41 (1.18) (3.30)**	2.89 (2.10) (2.25)	2.56 (1.74) (2.52)	0.001
	Intervention	3.11 (1.06) (2.71)	1.58 (1.65) (1.00)	2.02 (1.34) (1.44)	p<0.001$$
	p	0.16$	< 0.001	0.12	0.004$$$

*number was shown as frequency (percentage). **number was shown as mean (standard deviation) (median). $. Comparison of Rome IV symptoms between different times in each group with the Mann–Whitney test. $$. Comparison of Rome IV symptoms between different times in each group with general estimation model. $$$. Intervention between time and groups by general estimation model

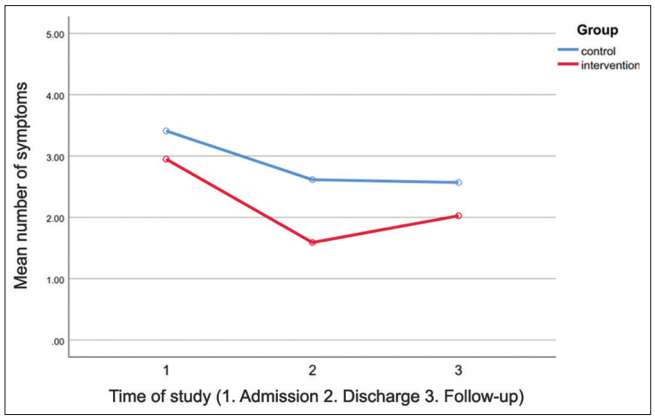

Figure 2: Trend of Rome IV symptom means in control and intervention group according to admission, discharge, and follow-up time

in patients with the first stroke, but hemorrhagic stroke patients had more constipation following stroke. On the other hand, in a study by Engler *et al*.,[20] female gender, elderly, prior history of constipation, and low fluid intake were factors independently associated with constipation in stroke. The de Miranda Engler *et al*.[17] study was conducted on chronic survivors undergoing rehabilitation but our study was conducted on acute clients in the internal ward and intensive care unit. Also, we matched two groups for age and type of stroke. Liu *et al*.[21] showed that age, paralysis, and severity of stroke are all important factors in the development of constipation following stroke. In the Li *et al*.[4] study, the incidence of constipation in hemorrhagic patients (66%) was higher than that in patients who were ischemic (51%). Although in the Lin *et al*.[18] study most stroke patients were of the ischemic type and had a lower mean age, the results are very similar to the present study. Concerning the type of stroke reported in the study, the type of stroke and age were matched as the factors affecting constipation in the present study, so it was not possible to compare. Also, the definitions of constipation and study designs varied between different studies that focused on constipation post-stroke. Furthermore, the reason for the difference with the Liu *et al*.[21] study is probably due to the higher mean age of patients (80 years) compared to the present study, which was 64 years. Also, a random stratified sampling method was used to compare stroke and age in the two groups in the present study. After the implementation of the nursing care plan, the incidence of new-onset constipation significantly decreased in the intervention group. Many studies revolving around medical complications do not include constipation as a complication. Khorrami *et al*.[22] showed that 72.70% of the intervention group and 54.50% of the control group had normal consistency after intervention with laxatives, and this difference was not significant, in contrast with the results of the current study. Routine nursing care showed a 32.80% reduction in the frequency of constipation from admission to discharge.

Khorrami *et al*.[22] examined the effect of laxatives on fecal excretion and found that there was no significant difference in the number of fecal excretions 4 days before/after the intervention between the two groups. In the intervention group, there was no type 1 excretion or constipation on the Bristol scale, but in the control group, one case (0.08%) had type 1 excretion or constipation. Type 7 or diarrhea was seen in one case (0.08%) in the intervention group and three cases (0.25%) in the control group, which was not significant. The results of the current study were similar to the Khorrami *et al*.[22] study before the intervention, but after the intervention, 66% had normal defecation in the intervention group. The reason for this difference may be due to the lower small sample size (12 cases) and use of only natural laxatives in the Khorrami *et al*.[22] study, but a structured nursing plan, including massage therapy, water, and electrolyte disturbance correction, training with pamphlets and books, followed by a more comprehensive intervention, was considered in the current study.

Furthermore, Lamas *et al*.[23] showed that abdominal massage significantly reduced the severity of gastrointestinal symptoms, constipation syndrome, and abdominal pain in the fourth and eighth weeks after the onset. Also, a significant increase in intestinal motility was observed in the intervention group compared to the control group. Harari *et al*.[24] showed intervention and evaluation by a trained nurse could improve symptoms of bowel disorder for up to 6 months and altered bowel lifestyle modifications up to 12 months.[24] Engler *et al*.[17] found that intestinal retraining had a positive effect on the number of intestinal habits. The current study confirms the results of Lamas, Harari, and Engler. Nursing interventions in these patients along with issuing instructions and booklets proved effective. However, the type of intervention and the person performing the criteria were different in the studies.

The trend of frequency of constipation from admission to follow-up changed significantly in the intervention group compared to the control group. Engler *et al*.[25] found that 55 patients (61%) had intestinal changes and 33 cases (37%) had decreased defecation. In the study by Yi *et al*.[26] with a 1-month follow-up in stroke patients, the results showed that 13 clients (25.5%) had constipation. Of these, 12 cases had increased symptoms of constipation. On the other hand, patients who had no constipation during hospitalization did not have constipation at follow-up. Comparing four bowel management programs based on time of care and use of suppositories, Venn *et al*.[27] showed that 39 patients (80%) received training within 1 month and the morning care plan was more effective than the evening exercise in patterning the bowel movement (13.30 vs 3.37). Harari *et al*.,[24] who compared the outcome of a nurse-trained intervention (assessment and education with provision of a booklet) vs routine care, found that the percentage of bowel movements per week, graded as ‘‘normal’’ by subjects, was significantly higher in the

nurse-led intervention group vs the routine care group during a 1-month observation (75% vs 55%; (p = 0.03)). Sue *et al*.[28] showed that constipation at 3-month follow-up after stroke can be considered as an indicator of symptoms and is of clinical importance.[5]

In the present study, the frequency of constipation in the intervention group decreased significantly from admission to 1-month follow-up. Although constipation would disappear gradually with time after stroke, many stroke patients have complete functional independence 6 months after an acute stroke. On the other hand, with the progression of a stroke, the patient's condition may worsen, and, consequently, a variety of complications, including intestinal complications, begin to emerge.[4] Although timing seems to be an important factor in obtaining results, other factors, such as the extent of patient interaction and treatment by the treatment team, should also be considered during the implementation of the care plan to achieve better results. In the Harari *et al*.[24] study, patient education was not conducted, no booklets are given, and nurses conducting the intervention were not specialists. Factors that could also affect the normal functioning of these patients include the nature of the disease, the level of disability, the extent of client involvement, and the efficiency of the treatment team regarding the implementation of the training program.

The strengths of our study include the first study of its kind conducted in Iran to present a care plan according to the nursing process in new-onset constipation after stroke. Nonetheless, some more limitations need to be addressed, which include lack of cooperation and the unwillingness of the patients to participate in the study, which we tried to overcome by discussing the study goals with patients. Patient deterioration (general medical condition of the patient), exclusion on the prognosis of stroke patients, or exclusion due to the death of the patient might have increased the duration of the research due to sampling.

Conclusion

A significant impact of the care plan on patients from admission to follow-up was seen but requires more client-side collaboration on intervention by telenursing as well as more interaction between the treatment team and the patients. This structural care plan can be suggested in nursing care to reduce the frequency of constipation.

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Conflicts of interest

Nothing to declare.

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