Pielęgniarstwo
Neurologiczne i Neurochirurgiczne
THE JOURNAL OF NEUROLOGICAL AND NEUROSURGICAL NURSING

eISSN 2299-0321 ISSN 2084-8021 www.pnn.wshe.pl **Artykuł Oryginalny/Original**

Identifying Constipation Risk in Neurosurgery Patients*

Określenie ryzyka zaparcia u chorych z dolegliwościami neurochirurgicznymi

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Abstract

Background. Preventing constipation is very important for patients in neurosurgery clinics and especially for those who had cerebral hemorrhage and brain tumor surgery as it might lead to elevated intracranial pressure. Therefore, it is necessary to diagnose constipation especially in individuals in neurosurgery clinics.
Aim. This study has been designed as a descriptive and a cross-sectional study intending to identify constipation risk and the factors affecting it in neurosurgery patients.
Material and methods. The population of the study consists of patients who stayed at a university hospital in Turkey between April 2011 and April 2012, and the sample population consists of 231 people selected by random sampling method. Data were collected using a Patient Information Form, Constipation Severity Instrument (CSI) and Constipation Risk Assessment Scale (CRAS). Data were analyzed using the SPSS version 11.5 for Windows
Results. 55,4% of the patients in the study were women and the average age was 43,80±13,65. CSI Total score average of the patients at admission was low (14,27±11,28). According to CRAS, 14,3% of the patients at admission, 40,7% of the patients on the 3rd day of surgery, and 32,5% of the patients at discharge were in medium and high risk group in terms of constipation. It has been determined that women, old people, people who use analgesics, and people who stay long at a hospital are at higher constipation risk.
Conclusions. As result of the data gathered in the study, it has been concluded that nurses working in neurosurgery clinics should not ignore preoperative and postoperative constipation risk in order to be able to give integrated care. **(PNN 2013;2(3):96-103)**
Key words: constipation, constipation risk assessment, neurosurgery, patients

Streszczenie

Wprowadzenie. W przypadku pacjentów klinik neurochirurgicznych, a szczególnie po wylewie krwi do mózgu oraz po operacji nowotworu mózgu, zapobieganie zaparciom jest bardzo istotne z uwagi na powodowany przez nie wzrost ciśnienia wewnątrzczaszkowego. Z tego względu koniecznym jest diagnozowanie zaparć szczególnie w przypadku osób przebywających w klinikach neurochirurgicznych.
Cel. Niniejsze badanie zostało zaplanowane z zamiarem identyfikacji ryzyka zaparcia i czynników na nie wpływających w sposób diagnostyczny i przekrojowy.
Materiał i metody. Populację badania stanowią pacjenci klinicznych szpitali uniwersyteckich w Turcji w okresie od kwietnia 2011 do kwietnia 2012, spośród których losowo wybrano próbę składającą się z 231 osób. Dane zebrane były przy użyciu Formularzy Informacyjnych Pacjenta, Instrumentu Twardości Zaparcia (CSI) oraz Skali Określania Ryzyka Zaparcia (CRAS). Dane były analizowane przy użyciu wersji 11.5 SPSS dla oprogramowania Windows.
Wyniki. 55,4% pacjentów poddanych badaniom stanowiły kobiety w wieku średnio 43,80±13,65 lat. Średni wynik CSI dla pacjentów przyjmowanych był niski (14,27±11,28). Natomiast wg CRAS; 14,3% pacjentów przyjmowanych, 40,7% pacjentów na 3 dni po operacji i 32,5% pacjentów wypisywanych znajdowało się w średniej i wysokiej grupie ryzyka wystąpienia zaparcia.

Wnioski. Na podstawie danych zgromadzonych podczas badania wywnioskowano, że pielęgniarki pracujące na oddziałach neurochirurgicznych w celu zapewnienia kompleksowej opieki nie powinny ignorować ryzyka zaparć przedoperacyjnych i pooperacyjnych. **(PNN 2013;2(3):96-103)**
Słowa kluczowe: zaparcie, określenie ryzyka zaparcia, neurochirurgia, pacjenci

Introduction

Intestinal excretion is one of the activities of living that all people carry out on a regular basis during their lives. Disposal of waste materials from the body on a regular basis through intestinal passage is important in order to maintain normal body functions. In order for an individual to perform intestinal excretion in the normal way, nutrition-excretory system and muscles (especially the abdominal and pelvic muscles) should work properly [1,2].

Although intestinal excretion is an activity that is performed daily, it is negatively affected by many factors, such as lifestyle, eating habits, lack of movement, developmental periods (infancy, old age, advanced age, disease and so on.) or psycho-social (stress, depression, etc.) factors, surgical operations that the person had before, cerebrovascular diseases, nerve injuries and head traumas, presence in foreign or physical environments, obsessive personality structure, motor and sensory disorders and drugs used. When there is a change in body functions or in case of an illness, the individual may not maintain performing the normal excretion. In addition, because intestinal functions may be affected by bio-physiological, psychological, socio-cultural, environmental and economic factors, excretory habits might also vary from individual to individual [1,2].

One of the problems that reduce the quality of life of the individual, affecting intestinal excretion is constipation. Constipation is not a disease but a symptom [2]. Today, however, the incidence rate of constipation varies between 2-34% according to communities [3,4]. According to results of studies conducted in Turkey, the incidence rate of constipation is reported to be between 22-40% [5]. Constipation is a term that expresses stool characteristics, defecation frequency, and stool transit time through intestinal tract and the passage of rectal content through the anal sphincter with difficulty. Hard and dry stool is thrown out at an abnormal frequency and with difficulty [6]. Although the signs and symptoms of constipation change from individual to individual, usually defecating less than 2 times, difficulty to pass and evacuate stool and hard defecation are the most common symptoms [2,7-9].

Nurses play a key role in determining the factors that cause constipation and the development of effective coping strategies. Nurses, while helping to eliminate problems associated with constipation, should be aware of the factors that influence constipation and its causes. Within this scope; the nurse diagnoses previous bowel habits of the individual, listens to bowel sounds, pulps the abdomen in terms of distension and makes a diagnosis using some diagnostic tools. The most important nursing role towards preventing constipation is education of the patient and family [10].

Neurosurgery clinic is one of the clinics where the patient remains bedridden for a long time and cannot perform some living activities independently. One of the major problems that can be seen in individuals in neurosurgery clinics is constipation. In addition, because it may cause an increase in intracranial pressure especially in patients who suffered a brain hemorrhage and who had brain tumor surgery, the prevention of constipation is quite important. Considering constipation and its symptoms, diagnosis of constipation is of vital importance particularly in the inpatient population in neurosurgery clinic. Neurosurgery nurse, offering 24-hour nonstop health care services to the individual patient and family, must diagnose constipation, have knowledge about the risk factors and monitor the patient continuously in terms of constipation.

Material and methods

Purpose of the Study

This study has been conducted in descriptive and cross-sectional design in order to determine constipation risk in neurosurgery patients and the factors that influence it.

Research Population and Sample

The population of the study consists of patients hospitalized in the neurosurgery clinic at a university hospital in Turkey. In this clinic, annually average of 1133 patients get in-patient treatment. This number was considered to be the population and in the sampling calculation done according to the formula of the known universe sample calculation; when the study is conducted on 226 people, it was concluded that actual ratio could be obtained with an error rate of 1.9 percentage points and 0.98 confidence (t; ∞; 0,02=2,326). The research was carried out on 231 people by adding 5 backups to the number of cases which were determined as 226 in the sample calculation. The 231 people that were decided to be included in the study were selected by random sampling method between the dates April 2011 – April 2012. Sample selection criteria;

- absence of any problem that prevents cognitive, affective and verbal communication with,

- that the individual is 18 years of age and over,
- that there is no spinal injury, paraplegia or quadriplegia that might physiologically affect intestinal excretion in the individual,
- that there is a planned surgical intervention.

Data Collection Tools

Data were collected by Patient Information Form, Constipation Severity Instrument (CSI), and Constipation Risk Assessment Scale (CRAS).

Patient Information Form: Consisted of questions related to medical diagnosis, age, gender, height, weight, body mass index, educational status, state of laxative use, diet and exercise level, general lifestyle and nutrition habits.

Constipation Severity Instrument (CSI): The Turkish reliability and validity of CSI, developed by Varma and his colleagues in 2008, were made by Kaya and Turan (2011) and it is a scale towards determining individuals' defecation frequency, intensity, and the difficulty/hardship during defecation the scale. CSI can also be used to measure the symptoms of constipation. There are questions in the scale. CSI has three sub-dimensions, Obstructive Defecation (OD), Colonic Inertia (CI) and the Pain. The score that can be taken in OD sub-dimension is 0-28, the score that can be taken in CI sub-dimension is 0-29, and the score that can be taken in Pain sub-dimension is 0-16. In the CSI, the lowest total score can be 0, and the maximum can be 73.A high score in the scale indicates serious symptoms. The internal consistency of the scale is (α = 0.88-0.91) and test-retest reliability was found to be high for all subscales (intra-class correlation coefficient = 0.84-0.91) [11-13].

Constipation Risk Assessment Scale (CRAS): The Turkish validity and reliability of CRAS, which was developed by Richmond in 2006 in order to assess the risk of constipation, were made by Kutlu et al. (2011). The test-retest reliability of the scale was found to be .59 for all subscales, Cronbach's Alpha coefficient was found to be 50.0 [14,15].

The scale is composed of 33 items with a possible range of overall index score 1 to 63. The overall score is categorized into three constipation risk groups: 1 through 10 refers to "low risk"; a score between 11 and 15 refers to "moderate risk"; and 16 and over indicates "high risk." Although this is a composite scale, it was also divided into four subsections relating to the risk factors associated with the development of constipation [16].

Implementation of the Study

At patient admission, Patient Information Form, CSI and CRAS were given to individuals who agreed to participate in the study and on the 3rdday after surgery and at discharge only CRAS was implemented.

Ethical Issues

Written permissions were obtained from the Ethical Committee (file number 10709/C-12.) and clinical managements of hospitals to carry out the study. All patients were given written and oral information about the study and participated after giving their written consent to do so. Participation in the study was fully voluntary for the patients and they were able to withdraw at anytime during the study, giving no explanation.

Data Analysis

The SPSS Statistics 11.5 package program (Statistical Package for the Social Sciences) was used for statistical analysis of the findings in the study. For the assessment of the Ordinal (continuous) data, the median, minimum and maximum values, mean, standard deviation was used; and for the assessment of nominal (non-continuous) the data frequency and percentage calculations were used; and the Kolmogorov-Smirnov distribution test was used in a group to examine whether or not the distribution share normal. Non-parametric methods were preferred for the statistical analysis because distributions were found to be not normal in the data (Table 1). In quantitative comparisons of the data, in the case of the two groups, Mann-Whitney U test was used for the inter-group comparison of parameters; in the case of more than two groups Kruskal-Wallis test was used for the inter-group comparison of parameters. Spearman's rho Correlation analysis was used to determine the relationship between the ordinal data.

Table 1. Normality Distribution Analysis Results of CSI and CRAS (N=231)

	Scales	Kolmogorov-Smirnov Z	*P*
CSI	Obstructive Defecation	3,90	0,000
	Colonic Inertia	4, 09	0,000
	Pain	6,42	0,000
	Total	4,03	0,000
CRAS	Admission	7,70	0,000
	3rd day of surgery	5,66	0,000
	Discharge	6,36	0,000

Results

It has been seen that of the patients involved in this study, 55.4% are women, 31,6% are in 31-43 age group, the mean age is 43.80±13.65, 39.8% have

body mass index 25-29.99 (overweight), average body mass index is 27.03±5.05, 38.1% are primary school graduate, 100% feed orally, 85.7% do not apply a special diet, 89.2% do not use laxatives, 52.4% maintain a sedentary lifestyle, and 76.6% do not do regular exercise (Table 2).

Table 2. The distribution of patients in terms of some individual features and features that may affect constipation (N=231)

	N (%)
Gender	
Female	128 (55,4)
Male	103 (44,6)
Age Groups (year)	
18-30	45 (19,5)
31-43	73 (31,6)
44-56	66 (28,6)
57 and above	47 (20,3)
Age (mean.±SD) (Min.-Max.)	43,80±13,65 (18-75)
Body Mass Index	
<18,5 (Thin)	3 (1,3)
18,50-24,99 (Normal)	84 (36,4)
25-29,99 (over weighted)	92 (39,8)
>30 (Obese)	52 (22,5)
Body Mass Index (Mean.±SD) (Min.-Max.)	27,03±5,05 (16.55-45.96)
Educational Status	
Illiterate	18 (7,8)
Literate	8 (3,5)
Primary school graduate	88 (38,1)
Secondary school graduate	35 (15,2)
High School graduate	46 (19,9)
College and higher	36 (15,6)
Diet Style	
Orally	231 (100)
Nasogastric tube and other	-
Implementing a special diet	
Yes	33 (14,3)
No	198 (85,7)
Laxative use	
Yes	25 (10,8)
No	206 (89,2)
General life Style	
Active	110 (47,6)
Sedentary	121 (52,4)
Doing exercise regularly	
Yes	54 (23,4)
No	177 (76,6)

Analyzing the distribution of CSI scores obtained from the patients on admission; it was found that mean score of Obstructive Defecation sub-category is 7.33±4.84, mean score of Colonic Inertia sub-category is 5.67±4.38, the average Pain score is 1.26±2.60, and CSI average total score was is 14.27±11.28 (Table 3). Scores of the patients from CRAS were found to be; at admission 7,01±3,48, 3rd day of surgery 9.96±3.04, at discharge 9.43±3.17 (Table 3).

Table 3. Distribution of scores patients obtained from CSI and CRAS (N=231)

	Scales	Minimum	Maximum	Median	Mean.±SD
CSI-admission	Obstructive Defecation	1,00	26,00	4,00	7,33±4,84
	Colonic Inertia	2,00	23,00	3,00	5,67±4,38
	Pain	0,00	12,00	0,00	1,26±2,60
	Total	4,00	57,00	8,00	14,27±11,28
CRAS	Admission	0,00	20,00	7,00	7,01±3,48
	3rd day of surgery	4,00	23,00	10,00	9,96±3,04
	Discharge	3,00	23,00	9,00	9,43±3,17

According to CRAS, 14.3% of the patients on admission, 40.7% of the patients on the 3rdday of surgery and 32.5% of the patients at discharge were determined to be in mid-and high-risk groups in terms of constipation (Table 4).

Table 4. Distribution of constipation risk according to CRAS on admission, 3rd day of surgery and discharge (N=231)

CRAS ranks	Admission		3rd day of surgery		Discharge	
	n	%	n	%	n	%
Low risk for constipation (score<10)	198	85,7	137	59,3	156	67,5
Medium risk for constipation (score 11-15)	27	11,7	81	35,1	66	28,6
High risk for constipation (score>16)	6	2,6	13	5,6	9	3,9
Total	231	100,0	231	100,0	231	100,0

Examining the scores patients obtained from CSI and CRAS on admission according to some of the individual characteristics of the patients that may affect constipation; it has been found that average score women obtained from both CRAS and CSI is higher compared to men and the difference was statistically significant ($p<0.05$). Although there was no significant difference between age groups, age averages, body mass index and the mean score of CSI, as age and body mass index increased, so did CRAS scores and the difference was found to be statistically significant ($p<0.001$).

It has been found that there is a significant relationship between laxative use, general lifestyle and doing regular exercise ($p<0.01$), and those who have sedentary lifestyle, who use laxatives, and who do not exercise regularly have higher CRAS CSI scores (Table 5).

Table 5. The distribution of CSI and CRAS scores on admission in terms of some individual features and features that may affect constipation (N=231)

Some individual features that may affect constipation	CSI	CRAS
	Mean.±SD	Mean.±SD
Gender		
Female	15,45±11,41	7,43±3,61
Male	12,81±11,01	6,49±3,24
	Z^{MWU}=-2,65; p=0,008	Z^{MWU}=-2,12; p=0,034
Age groups (year)		
18-30	12,36±7,30	5,38±1,83
31-43	15,55±13,01	6,90±3,59
44-56	12,27±9,25	7,44±3,68
57 and above	16,91±13,44	8,13±3,73
	$x^{2(KW)}$=3,64; p=0,303	$x^{2(KW)}$=17,59; p=0,001
Age (mean.±SD) (Min.-Max.)	r=-0,104; p=0,117	r=-0,248; p=0,000
Body Mass Index		
<18,5 (Thin)	7,00±1,00	6,33±0,58
18,50-24,99 (Normal)	13,44±10,10	6,59±3,14
25-29,99 (over weighted)	13,61±9,87	6,68±3,42
>30 (Obese)	17,19±14,85	8,33±3,93
	$x^{2(KW)}$=2,74; p=0,433	$x^{2(KW)}$=10,51; p=0,015
Body Mass Index	r=-0,038; p=0,561	r=0,133; p=0,043
Frequent laxative use		
Yes	27,12±12,89	9,84±4,97
No	12,71±10,04	6,67±3,10
	Z^{MWU}=-5,32; p=0,000	Z^{MWU}=-3,33; p=0,001
General life Style		
Active	11,37±8,86	6,25±2,90
Sedentary	16,90±12,58	7,70±3,81
	Z^{MWU}=-3,94; p=0,000	Z^{MWU}=-3,05; p=0,002
Doing exercise regularly		
Yes	11,07±8,94	6,04±2,77
No	15,24±11,76	7,31±3,62
	Z^{MWU}=-2,88; p=0,004	Z^{MWU}=-2,61; p=0,009

Table 6. The distribution of CRAS scores on the 3rd day of surgery in terms of some features that may affect constipation (N=231)

Some features that may affect constipation	N (%)	CRAS Mean.±SD
	Diet Style	
Orally	226 (97,8)	9,92±3,05
Nasogastric tube and other	5 (2,2)	11,40±2,30
		Z^{MWU}=-1,35; p=0,178
	Implementing a special diet	
Liquid diet	7 (3,0)	10,29±5,19
Soft Diet	8 (3,5)	11,50±4,63
Normal	211 (91,3)	9,88±2,92
Other	5 (2,2)	10,40±1,14
		$x^{2(KW)}$=1,81; p=0,614
	Analgesic use	
Yes	201 (87,0)	13,43±3,71
No	30 (13,0)	9,44±2,56
		Z^{MWU}=-5,96; p=0,000

Examining the scores patients obtained from CRAS on 3rd day of surgery according to some of the characteristics of the patients that may affect constipation; while there was no significant difference between CRAS scores in terms of diet style and application of special diet, it was found that those who used analgesic had higher average scores (Table 6).

Examining the scores patients obtained from CRAS at discharge according to some of the characteristics of the patients that may affect constipation; while there was no significant difference between CRAS scores in terms of diet style and application of special diet, it was found that those who used pain killers and those who stayed at the hospital longer had higher average scores (Table 7).

and at discharge, women, the elderly, the analgesic users and those who stay in the hospital for a long time carry constipation risk.

In order to determine if patients carried risk in terms of constipation prior to surgery, CSI, which helps to determine defecation features in the last 1 month, was used.

It has been found that at patient admission, mean score of Obstructive Defecation sub-category is 7.33±4.84, mean score of Colonic Inertia sub-category is 5.67±4.38, the average Pain score is 1.26±2.60, and CSI average total score is 14.27±11.28. This result is similar to results of another study implemented on healthy individuals [11-13], and showed that this group, who came to the neurosurgery clinic in order to

Table 7. The distribution of CRAS scores at discharge in terms of some features that may affect constipation (N=231)

Some features that may affect constipation	N (%)	CRAS Mean.±SD
	Implementing a special diet	
Liquid diet	5 (2,2)	8,00±3,74
Soft Diet	4 (1,7)	15,00±5,29
Normal	216 (93,5)	9,36±3,05
Other	6 (2,6)	9,50±2,88
		$x^{2(KW)}$=5,40; p=0,145
	Analgesic use	
Yes	202 (87,4)	13,31±3,77
No	29 (12,6)	8,88±2,65
		Z^{MWU}=-6,06; p=0,000
	Duration of Stay at the Hospital	
10 days and less	124 (53,7)	8,93±3,06
11-21	82 (35,5)	9,54±2,60
22 and above	25 (10,8)	11,60±4,38
		$x^{2(KW)}$=11,18; p=0,004
Length of Stay at the Hospital (Mean±SD)	12,48±10,65	r=0.235; p=0.000
(Min.-Max.)	(1-120)	

Discussion

In clinical practice constipation is often an overlooked aspect of patient care and first gains attention when it has become a severe problem for the patient. Constipation increases the risk of postoperative complications, can prolong hospital stay, increase financial cost, and staff nursing care time [15,17].

Previous studies describing the frequency of general complications after neurosurgery have omitted constipation. Therefore as far as we know, no previous study has described the prevalence or incidence of constipation after neurosurgery. In this study, designed to determine the risk of constipation and the factors affecting it in neurosurgery patients; it has been found that patients have low risk of constipation prior to surgery, have higher risk on the 3rd day after the surgery

be operated formed the sample of the study, carries low risk in terms of pre-operative constipation.

Postoperative absolute bed rest for a while, suppression of defecation feeling, the use of bedpans, lack of privacy in the hospital setting, patients' difficulty to express discomfort and analgesic drugs (opioid and nonopioid agents) used in pain management might cause in patients intestinal excretion problems.

In a study conducted by Atabek, the rate of constipation in bedridden patients due to osteoporotic fracture was stated as 40% [18,19]. In this study, according to CRAS 14.3% of the patients on admission, 40.7% on the 3rd day of the surgery, and 32.5% at discharge were determined to be in mid-and high-risk groups in terms of constipation. These results showed that the patient should be carefully diagnosed in terms of constipation and necessary nursing interventions

should be made after the surgery until the patient is discharged.

In international and community-based studies, the incidence of constipation has been shown to be twice as many in women than men [5,7,13,20-22]. In this study, both average CRAS and CSI scores of women and were found to be higher than men. This result is in line with other studies, and suggests that female hormones increase the risk of constipation.

Increasing age is effective on the prevalence and severity of constipation as well as chronic diseases. In old age, endocrine disorders, neurological diseases, depression and urinary incontinence are commonly seen and drug use associated with these diseases increases. In addition, in elderly people, a decrease in intestinal peristalsis, abdominal muscle elasticity and mucus secretion is seen [2]. In studies conducted, it has been seen that constipation gradually increases after the age of 65 and the biggest increase is at the age of 75 [20]. This study also showed an increased risk of constipation with age.

There is a close relationship between motion and intestinal peristalsis. There is proportional relationship between the emergence of the problem of constipation and lack of movement or extension of time spent in bed. Harari [23], supports the idea of immobility being a primary risk factor, especially in elderly people. However, in 1993 Resende et. al. [24], showed no effect with increased walking but, using a combined approach of activity and diet, found reduced laxative use in elderly patients [25]. Klauser et al [26], stated there was no evidence that constipated patients drank less fluid or took less exercise than healthy subjects.

In this study, it was found that those who have sedentary lifestyle and those who do not exercise regularly have higher CRAS and CSI scores. This result showed that especially the early postoperative mobilization is very important in the prevention of constipation.

The common belief that people must have a daily bowel movement has led to self-medicating with laxative products. Although people may feel relief when they use laxatives, typically they must increase the dose over time because the body grows reliant on laxatives in order to have a bowel movement. As a result, laxatives may become habit-forming [26,27]. Similar to the knowledge in the literature, in this study, those who use laxatives have higher CSI and CRAS scores.

In the literature, it is emphasized that drugs such as antidepressants, antispasmodics, diuretics, anticonvulsants and analgesic drugs increase the risk of constipation [2]. Also, Hassouneh et al. [28] in a study on pain management in craniotomy patients found that 66% of patients had a side effect of constipation. In this study, it was observed that individuals who used analgesic drugs on the 3rd day of surgery and on discharge had high constipation risk. This result suggested reducing especially the use of opioid analgesic for pain management as much as possible, trying out alternative pain management techniques.

Conclusions

Constipation risk of patients in neurosurgery clinics is at a considerable level. For this reason, in order to give integrative care, nurses need to make detailed diagnostic in terms of pre-operative and post-operative constipation risk and choose appropriate interventions for the individual and implement them.

Implications for nursing practice

As this study shows that 40.7% of the patients on the 3rdday of surgery and 32.5% of the patients at discharge were determined to be in mid-and high-risk groups in terms of constipation, it makes it a very important challenge for nurses to develop relevant initiatives in order to reduce the number of patients having postoperative constipation. A controlled study is needed to test the effect of an approach that can be practical at the patients during the hospital stay.

Acknowledgements

We are grateful to Istanbul University Unit of Scientific Research Projects (IUBAP) for their invaluable contributions to the study (Project No: 17887).

**This study has been supported by Istanbul University Unit of Scientific Research Projects (Project No: 17887) This sentence is removed*

References

[1] Kaya N. Yaşam modeli. In Babadağ K., Aştı T.A. (Ed.), *Hemşirelik esasları uygulama rehberi*. İstanbul Medikal Yayıncılık, İstanbul 2008;1-7.

[2] Kaya H. Bağırsak boşaltımı ve gastric entübasyon. In Aştı T.A., Karadağ A. (Ed.), *Klinik uygulama becerileri ve yöntemleri*. Adana Nobel Kitabevi, Adana 2011;1116-1136.

[3] McCrea G.L., Miaskowski C., Stotts N.A., Macera L., Paul S.M., Varma M.G. Gender differences in self-reported constipation characteristics, symptoms, and bowel and dietary habitsamong patients attend-

ing a specialty clinic for constipation. *Gender Medicin*. 2009;6(1):259-271.
[4] Talley N.J. Definitions, epidemiology and impact of chronic constipation. *Reviews in Gastroenterological Disorders*. 2004;4(2):3-10.
[5] Uysal N., Khorshid L., Eşer İ. Sağlıklı genç bireylerde konstipasyon sorununun belirlenmesi. *TAF Preventive Medicine Bulletin*. 2010;9(2):127-132.
[6] Ay F. Bağırsak boşaltımı ve uygulamaları. In Sabuncu N., Ay F.A. (Ed.), *Klinik beceriler sağlığın değerlendirilmesi hasta bakım ve takibi*. Nobel Tıp Kitabevleri, İstanbul 2010;496-509.
[7] Dener C. *Genel cerrahi*. Klinisyen Tıp Kitabevleri, İstanbul 2006.
[8] Papatheodoridis G.V., Vlachogiannakos J., Karaitianos I., Karamanolis D.G.A. Greek survey of community prevalence and characteristics of constipation. *European Journal of Gastroenterology &Hepatology*. 2010;22(3):354-360.
[9] Yurdakul İ. Konstipasyon. In Yurdakul İ., Şentürk M., Tuncer E., Göksoy E. (Ed.), *Gastroenterolojide klinik yaklaşım*. İ.Ü. Cerrahpaşa Tıp Fakültesi Sürekli Tıp Eğitimi Etkinlikleri, İstanbul 2004;121-132.
[10] Kaya N., Kaya H. Nöro-onkoloji hastasının hemşirelik bakımı. *Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi*. 2009;2(1):65-73.
[11] Varma M.G, Wang J.Y., Berian J.R., Patterson T.R., McCrea G.L., Hart S.L. The Constipation severity instrument: A validated measure. *Disease of The Colon &Rectum*. 2008;51:162-172.
[12] Kaya N., Turan N. Reliability and validity of constipation severity scale. *Turkiye Klinikleri Journal of Medical Sciences*. 2011;31(6):1491-1501.
[13] Turan N, Kaya N, Kaya H, Öztürk A, Eskimez Z, Yalçın N. Hemşirelik öğrencilerinin bazı değişkenler açısından konstipasyon sorunları. *İstanbul Üniversitesi Florence Nightingale Hemşirelik Yüksekokulu Dergisi*. 2011;19(3):168-178.
[14] Kutlu A.K., Yılmaz E., Çeçen D., Eser E. The reliability and validity of the Turkish version of the constipation risk assessment scale. *Gastroenterology Nursing*. 2011;34;3:200-208.
[15] Richmond J.P. Development of a constipation risk assessment scale. *Journal of Orthopaedic Nursing*. 2006;10(4):186-197.
[16] Richmond J.P., Wright M.E. Review of the literature on constipation to enable development of a constipation risk assessment tool. *Clinical Effectiveness In Nursing*. 2004;8:11-25.
[17] Rasmussen L.S. Constipation and defecation pattern the first 30 days after thoracic surgery. *Scandinavian Journal of Caring Science*. 2010;24;244-250.
[18] Atabek T. Osteoporotik kırık nedeniyle yatağa bağımlı yaşlı hastaların yakınmalarının incelenmesi. *Hemşirelik Bülteni*. 1994;8:37-44.
[19] Şendir M., Büyükyılmaz F., Aştı T., Gürpınar Ş., Yazgan İ. Postoperative constipation risk assessment in Turkish orthopedic patients. *Gastroenterology Nursing*. 2012;35(2):106-113.
[20] McCrea G.L., Miaskowski C., Stotts N.A., Macera L., Paul S.M., Varma, M.G. Age differences in patients evaluated for constipation characteristics, symptoms and bowel and dietary habits. *Journal of Wound, Ostomy and Continence Nursing*. 2010;37(6):667-676.
[21] Stewart W.F., Liberman J.N., Sandler R.S. Epidemiology of constipation (EPOC) study in the United States: Relation of clinical subtypes to socio-demographic features. *American Journal of Gastroenterology*. 1999;94:3530–3540.
[22] Talley N.J., Weaver A.L, Zinsmeister A.R., Melton L.J. Onset and disappearance of gastrointestinal symptoms and functional gastrointestinal disorders. *American Journal of Epidemiology*. 1992;136:165-177.
[23] Harari D. Bowel care in older age. In Norton C, Chelvanayagam S. (Eds.), *Bowel continence nursing*. Beaconsfield Publishers, Beaconsfield 2004.
[24] Resedence T.L., Brocklehurst J.C., O'Neil P.A. A pilot study on the effect of exercise and abdominal massage on bowel habit in continuing care patients. *Clinical Rehabilitation*. 1993;7:204-209.
[25] Rigby D, Powell M. Causes of constipation and treatment options. *Primary Health Care*. 2005;15(2):41-49.005.
[26] Klauser A.G., Peyerl C., Schindlbeck N.E., Müller-Lissner S.A. Nutrition and physical activity in chronic constipation. *European Journal of Gastroenterology and Hepatology*. 1992;4:227-233.
[27] Richmond J.P. Prevention of constipation through risk management. *Learning Disability Practice*. 2003; 6:31-38.
[28] Hassouneh B, Centofanti J.E., Reddy K. Pain management in post-craniotomy patients: a survey of Canadian neurosurgeons. *Canadian Journal of Neurological Sciences*. 2011;38(3):456-60.

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Conflict of interest: None
Funding: This study has been supported by Istanbul University Unit of Scientific Research Projects (IUBAP) (Project No: 17887)
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Received: 14.03.2013
Accepted: 07.06.2013