 **Original Research / Özgün Araştırma**

**The Effect of Inpatient Bowel and Bladder Training Given by The Nurse At a Rehabilitation Clinic on Sphincter Control**

Bir Rehabilitasyon Kliniğinde Yatan Hastalara Hemşire Tarafından Verilen Mesane ve Bağırsak Eğitiminin Sfinkter Kontrolüne Etkisi

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**ABSTRACT**

**Aim:** The aim of this study was to determine how the bowel and bladder training provided by the rehabilitation nurse affects sphincter control and to emphasize its importance. **Methods:** This study was designed semi-experimental. The sample of the study consisted of 130 individuals requiring bladder-bowel training and rehabilitation. Urinal, diaper, bedpan, bladder catheterization as a heterogeneous group of patients with different status have formed the sample. The functional independence measure was used to evaluate the effectiveness of the training and sphincter control in patients who were provided bowel and bladder training. The patient was also provided with a training booklet with detailed information. **Results:** The training given to the patients was found to create a significant difference in bladder sphincter control and the FIM scores to increase after the training (p <0.05). The training was also found to significantly increase the FIM bowel sphincter scores (p<0.05). **Conclusions:** We found that as a result the bowel and bladder training provided by rehabilitation nurses had positive and useful effects on the sphincters and allowed the patients to independently continue their daily living activities.

**Key words:** Bladder, bowel, FIM, rehabilitation, nursing

**ÖZET**

**Amaç:** Bu çalışmanın amacı rehabilitasyon hemşiresi tarafından verilen barsak ve mesane eğitiminin sfinkter kontrolünü nasıl etkilediğini ve önemini vurgulamaktır. **Yöntem:** Bu çalışma tasarımı yarı deneyseldir. Çalışmanın örneklemi mesane – barsak eğitimi ve rehabilitasyon gerektiren 130 kişiden oluştu. İdrar, bebek bezi, sürgü, mesane kateterizasyonu gibi farklı durumdaki hastalardan heterojen bir grup olarak örneklemi oluşturdu. Bağırsak ve mesane eğitimi verilen hastalarda sfinkter kontrolünün etkinliğini değerlendirmek için fonksiyonel bağımsızlık ölçeği kullanıldı. Hastaya ayrıca ayrıntılı bilgi içeren bir eğitim kitapçığı verildi. **Bulgular:** Hastalara verilen eğitimin mesane sfinkter kontrolünde ve fonksiyonel bağımsızlık ölçeği skorlarında eğitim sonrası anlamlı bir fark yarattığı bulundu (p <0.05). Eğitimin fonksiyonel bağımsızlık ölçeği barsak sfinkter skorlarını anlamlı olarak arttırdığı bulundu (p <0.05). **Sonuç:** Sonuç olarak rehabilitasyon hemşirelerinin sağladığı bağırsak ve mesane eğitiminin sfinkterler üzerinde olumlu ve faydalı etkileri olduğunu ve hastaların günlük yaşam aktivitelerini bağımsız olarak sürdürmelerini sağladığını belirledik.

**Anahtar kelimeler:** Mesane, barsak, FBÖ, rehabilitasyon, hemşirelik

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**Introduction**

Rehabilitation is a treatment process aiming to make sure that an individual who has lost some skills from birth or later due to a disease, accident or injury can become more functional to himself, his/her family and the society by letting him/her reach the best possible level from the medical, psychological, social and professional aspects and making arrangements to minimize the results of permanent disabilities.1,2,3,4 The aim of rehabilitation is to make sure the mental and/or physical abilities lost due to disorder return to normal. 5

While a comprehensive and integrated rehabilitation program increases independence, it also shortens the bedbound duration of the patient and increases the quality of life, thus providing a great social and financial benefit. 6

The rehabilitation nurse, with her/his education, knowledge and experience, is the health professional who can best coordinate, support and facilitate the adaptation process for the treatment and the care of the individuals who need rehabilitation.7,8 The Australian Rehabilitation Nurses Association (ARNA) has defined the objectives of rehabilitation nursing as increasing self-care, correcting impaired functions, and increasing the patient's quality of life. 9

Most patients requiring rehabilitation experience changes in bowel and bladder function due to their disorder. Managing these altered bladder and bowel functions is a significant part of rehabilitation care. Possessing information about normal bowel and bladder functions as well their dysfunctions is therefore important for the rehabilitation nurse. 7

The purpose of bladder training is to encourage the patient to regularly urinate, prevent or decrease urinary incontinence, and ensure urination control by delaying, inhibiting or limiting urination. 10 Bowel training is used to regulate the dietary and fluid intake and to continue the relevant exercises and normal defecation habits in order to help normal defecation. The patients should be supported in order to maintain normal defecation habits in the case of stool incontinence, and the factors causing incontinence and the previous bowel habits should be identified. Cooperation with the patient is necessary for making decisions regarding the maintenance of normal bowel habits. 10,11

**Aim**

The aim of this study was to determine how the bowel and bladder training provided by the rehabilitation nurse affects sphincter control and to emphasize its importance.

**Method**

**Design**

This semi-experimental study aimed to determine the effect on sphincter control of bowel and bladder training provided by the nurse to patients hospitalized at a rehabilitation clinic.

**Sample**

The population of the study consisted of the patients who had been admitted to Training and Research Hospital. The sample of the study consisted of 130 individuals requiring bladder training and rehabilitation after being admitted to the clinic between 3 July 2017 and 5 February 2018 and who agreed to participate in the study. Urinal, diaper, bedpan, bladder catheterization as a heterogeneous group of patients with different status have formed the sample.

The study inclusion criteria were identified as the lack of bowel and bladder control, aged eighteen years or older, being literate and able to communicate, reading the informed consent form and accepting to participate in the study.

**Ethical considerations**

The Ethics Committee permission necessary to conduct the study was obtained from Social and Human Sciences Ethics Committee of a public university. Following the Ethics Committee permission, written permission was also obtained from the Training and Research Hospital where the study took place.

**Collection of the Data**

The data collection form prepared by the investigator in accordance with the literature was used to identify the demographic data of the patients and evaluate the bowel and bladder status in the study.

The functional independence measure was used to evaluate the effectiveness of the training and sphincter control in patients who were provided bowel and bladder training. The Functional Independence Measure (FIM) was developed by Keith et al. (1987) and the Turkish validity and reliability study was conducted by Küçükdeveci et al. (2001). This measure has two sub-dimensions: motor and cognitive. We used items G and H of the motor sub-dimension to evaluate bowel and bladder control in this study. G ve H sub-dimension is evaluated on the 7-point Likert scale (1 = total help, 7 = total independence). Patient's 6-7 points mean that he does the activity without help.

**Study Conduct**

After the patient was admitted to the clinic, the first interview was used to get to know the patient and the bowel and bladder functions were verbally queried. Consenting patients were given the socio-demographic questionnaire to complete. The patient was given 24 hours to ensure ample time to read, understand and complete the questionnaire. The patient was also provided a training booklet with detailed information. The booklet primarily contained information on bowel and bladder functions. Incontinence and constipation were explained, followed by a section on bowel and bladder training. Clear information was provided on both types of training separately to make sure the patient understood.

After the initial evaluation, the patient was interviewed weekly and changes in the bowel and functions of the bladder were recorded until discharge in the relevant parts of the functional independence measure by the investigator.

**Data Analysis**

The SPSS 21 software program was used in the evaluation of the data.

**RESULTS**

Males made up 37.7% (n=49) and females 62.3% (n=81) of the patients. The mean age of the patients was 63.9±14.3 years. Chronic disease was present in 66.9%, mostly consisting of hypertension (HT) (49.4%) and HT + Diabetes Mellitus (DM) (37.9%). The analysis revealed that the majority of the patients included in the study had experienced Cerebrovascular Disease (CVD) (50.0%), Lomber Disc Herniation (LDH) (13.1%) and Spinal Cord Injury SCI (8.5%). Sixty percent of the patients could walk and 42.3% did not need support while 61.5% of the bed-confined patients had supported in-bed mobility.

According to the bladder evaluation at the initial clinic admission, 50.0% of the patients could use the toilet and 24.6% were using diapers. When queried about urinary incontinence, 31.2% did not experience incontinence and those that did (23.4) reported incontinence once or multiple times per week. When the initial bowel status was queried, 59.2% of the patients were using the toilet and 48.5% were using laxatives for constipation while incontinence was very rare (5.2%).

The mean FIM value was 2.7±1.9 before and 5.1±2.0 after bladder training. Statistical analysis showed a significant difference between these values (p<0.05) (Table 1).

The mean FIM value was 4.0±2.6 before and 6.0±2.0 after bowel training. A statistically significant difference was again present (p<0.05) (Table 2).

There was a significant difference between the admission and discharge bladder scores by gender (p>0.05). The admission and discharge bladder scores of the mobilized patients were significantly higher than the patients who could not walk (p<0.05). A significant difference was also found between the bladder status at admission to the clinic and at discharge (p<0.05). The individuals able to use the toilet at first admission had significantly higher scores than the others. The discharge bladder scores in the toilet group were significantly higher than those of the sterile intermittent catheterization (SIC)/Clean intermittent catheterization (CIC) and diaper groups and similarly, the discharge bladder scores of the bedpan group were significantly higher than the scores of the catheter, SIC/CIC and diaper groups. Analysis of the effect of bowel status at admission on the initial bladder score revealed lower bladder scores in patients using diapers and the difference was statistically significant (p<0.05). The bladder scores of those using diapers were significantly higher at discharge than at admission. Analysis of the defecation status at admission and discharge revealed a statistically significant difference (p<0.05). (Table 3).

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| **Table 1. Score of bladder condition according to FIM / sphincter control before and after training(n=130)** |
|  | **FIM/SPHINCTER CONTROL**  |
|  | **X±SD** | **Min** | **Max** | **Test Statistic** |
| **Admission**  | 2.7±1.0 | 1.0 | 7.0 | **t** | **p** |
| **Discharge**  | 5.1±2.0 | 1.0 | 7.0 | -13.8 | 0.0001 |

 t= t test

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| **Table 2. Evaluation of intestinal status according to FIM / sphincter control before and after training (n=130)** |
|  | **FIM/SPHİNCTER CONTROL** |
|  | **X±SD** | **Min** | **Max** | **Test Statistic** |
| **Admission** | 4.0±2.6 | 1.0 | 7.0 | **t** | **p** |
| **Discharge**  | 6.0±2.0 | 1.0 | 7.0 | -9.6 | 0.0001 |

 t= t test

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| **Table 3. Comparison of bladder FIM scores before and after training according to some characteristics of patients** |
|  | **FIM/SPHİNCTER CONTROL** |
|  |  | **Admission**  | **Discharge** |
| **Characteristic** | **n** | **X±SD** | **X±SD** |
| **Gender** |  |  |  |
| Female  | 81 | 2.8±1.9 | 5.1±2.0 |
| Male  | 49 | 2.4±2.0 | 5.1±2.0 |
|  |  | z= -1.4 p= 0.137 | z= -0.17 p= 0.863 |
| **Mobilite State** |  |  |  |
| Walking  | 78 | 3.6±1.9 | 5.8±1.4 |
| No walking  | 52 | 1.3±1.0 | 4.0±2.2 |
|  |  | z= -7.654 p= 0.000 | z= -4.835 p=0.000 |
| **Hospitalized bladder condition** |  |
| Bladder Catheterization | 22 | 1.0±0.0 | 4.2±2.5 |
| SIC/CIC | 4 | 2.0±1.4 | 3.7±2.7 |
| Diaper  | 32 | 1.0±0.2 | 4.1±2.1 |
| Urinal/Bedpan | 7 | 3.1±2.1 | 5.5±1.5 |
| Toilet  | 65 | 4.1±1.7 | 5.9±1.4 |
|  |  | K W= 94.627 p= 0.000 | K W= 19.593 p= 0.001 |
| **Bowel status at admission** |  |
| Diaper  | 53 | 1.0±0.1 | 4.0±2.3 |
| Toilet | 77 | 3.8±1.8 | 5.8±1.3 |
|  |  | z= -9.2 p= 0.001 | z= -4.4 p= 0.001 |
| **Stool status**  |  |  |  |
| No constipation, regulary | 26 | 2.8±1.2 | 5.3±1.6 |
| Constipation, using laxative  | 63 | 3.7±2.1 | 5.7±1.6 |
| No constipation, using diaper  | 41 | 1.0±0.1 | 4.1±2.4 |
|  |  | K W= 59.884 p= 0.000 | K W= 12.140 p= 0.002 |

 z = Mann Whitney U

 KW=KruskallWallis

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| **Table 4. Comparison of before and after-training intestinal FIM scores according to some characteristics of patients** |
|  | **FIM/SPHINCTER CONTROL** |
|  |  | **Admission** | **Discharge** |
| **Characteristic** | **n** | **X±SD** | **X±SD** |
| **Gender**  |  |  |  |
| Female  | 81 | 4.4±2.5 | 6.1±1.8 |
| Male  | 49 | 3.4±2.6 | 5.8±2.2 |
|  |  | z= -2.1 p= 0.039 | z= -0.23 p= 0.811 |
| **Mobilite State** |  |
| Walking  | 78 | 5.5±1.7 | 6.8±0.8 |
| No walking  | 52 | 1.7±1.8 | 4.8±2.6 |
|  |  | z= -7.654 p= 0.000 | z= -6.158 p=0.000 |
| **Hospitalized bladder condition** |  |
| Bladder Catheterization | 22 | 1.5±1.6 | 4.7±2.7 |
| SIC/CIC | 4 | 3.7±3.2 | 5.2±2.8 |
| Diaper  | 32 | 1.2±0.9 | 5.1±2.4 |
| Urinal/Bedpan | 7 | 5.4±1.9 | 6.0±2.2 |
| Toilet  | 65 | 6.1±0.7 | 6.8±0.5 |
|  |  | KW= 90.045 p= 0.000 | K W= 30.781 p= 0.000 |
| **Bowel status at admission** |  |
| Diaper  | 53 | 1.0±0.1 | 4.7±2.6 |
| Toilet  | 77 | 6.1±0.8 | 6.8±0.5 |
|  |  | z= -10.3 p= 0.001 | z= -6.1 p= 0.001 |

z = Mann Whitney U, KW= Kruskall Wallis, Steril intermittent catheterization: SIC Clean intermittent catheterization: CIC

A significant difference was found between the genders in terms of initial bowel score (p<0.05). The initial bowel scores were significantly higher in females. No significant difference was found between the genders in terms of the bowel scores during discharge (p>0.05). There was a statistically significant difference between the mobilization status in terms of the initial and discharge bowel scores (p<0.05). The initial and discharge bowel scores of mobilized patients were significantly higher. A statistically significant relationship was present between the initial bladder status and the initial and discharge bowel scores (p<0.05). The initial bowel scores in the toilet group were significantly higher than the scores of the catheter, SIC/CIC and diaper groups. The initial bowel score of the Urinal/Bedpan group was significantly higher than the catheter, SIC/CIC and diaper groups. The discharge bowel score was significantly higher in the toilet group. The bowel score at admission was significantly lower in patients using diapers (p<0.05). There was also a significant increase between the admission and discharge values of those using diapers. The scores of the patients without constipation but using diapers were lower than the other patients (Table 4).

**DISCUSSION**

Bowel and bladder training undoubtedly have an important role in the rehabilitation process. Such training results in marked changes in the patient's living conditions and quality of life. The results of this study are therefore very important. Gezginci et al. compared 3 different teaching methods in behavioral therapy programs for overactive bladder in 2018. In conclusion, verbal training with a brochure was found to be the most effective method.12

The training given to the patients was found to create a significant difference in bladder sphincter control and the FIM scores to increase after the training (p <0.05). The training was also found to significantly increase the FIM bowel sphincter scores (p<0.05). (Table 1-2). We are not aware of any other study on rehabilitation patients with the same content and evaluating sphincter control with FIM in the literature. However, the admission and discharge FIM values of the patients were found to increase significantly in studies evaluating the motor FIM sub-measure including bowel and bladder control. In this regard, the literature results support our findings.

Aydın et al. evaluated the FIM scores of hemiplegic patients in 2016 and found no difference between scores at the house and hospital. They reported that a rehabilitation program can be prepared according to the admission FIM score and that FIM can be used to effectively evaluate the quality of the care. 15 Aizen et al. similarly emphasized in 2018 that the evaluations with FIM could provide correct measurements for functional gains to be understood. 16 Scrutinio et al. (2015) found a significant increase in motor FIM results with stroke rehabilitation in 722 patients. 17 Carhalvo et al. (2015) reported admission bowel and bladder scores to increase afterward in Parkinson's disease patients. 18

We did not find a difference between the bowel and bladder FIM scores of our patients by gender (Table 3-4). Women were reported to experience higher rates of incontinence than men by Goode et al. (2008). In their study on 986 subjects over the age of 65, and by Meseli (2016) in their study on 431 subjects, again over the age of 65. 19,20 Bindawas et al. (2018) found the FIM scores of females to be lower than those of males. 21 Demir (2015) reported as 41.8% of women that experienced incontinence once a week or less, 33.2% once a week or more, 15.1% every day and 9.9% one or multiple times per day.14 The lack of a significant difference by gender in our study could be due to the low number of male patients and the fact that they conceal their problems because of culture.

 We found the training given to patients who could become mobilized without support to provide better results than training given to patients who could mobilize with a cane or walker. It is possible that this more favorable result was due to the easier access to the toilet of patients who could become mobilized without support. Hospitalization is known to play an important role in the development of urinary incontinence in subjects with restricted mobility.22 Although the relevant literature is limited, Alves et al. found high-impact exercise to cause more urinary incontinence than a low-impact exercise in 2017.23 Positive results such as decreased incontinence and improved living conditions were seen with a 6-week bladder and pelvic floor exercise training program together with bladder training by Ersin in 2014.24 Our study indicates that mobilization significantly decreases risk in patients with a constipation problem and it is easier to solve the problem with physical activity in mobilized patients. Iovino et al. similarly found in 2013 that being immobile for a long time increases constipation and risk factors.25 Physical exercise was found to be protective against constipation in the study by Ayaz et al. in 2014. 26 Our results are similar to the literature in this regard.

While the rates of catheter and diaper use, with the lowest FIM scores, were high on admission bladder status examination, this rate was seen to decrease after training in this study. Another study with results similar to ours is the one conducted by Ergun in 2014 where there was a significant difference in the rate of catheter and diaper use after training and toilet use increased as a result. 27

Evaluation of the effect of admission bladder status on bowel status revealed that the constipation problem of patients who could use the toilet decreased further with training. A similar result was obtained in the 2009 study by Akinci and constant constipation was found to increase the fecal incontinence level.28 A history of constipation was present in patients with urinary incontinence in the study conducted by Camtosun in 2008.13 The bowel training given to the patients who were suffering from constipation was found to produce significant results by Ayaz et al. (2014). 26 In this regard, our results and the literature information support each other.

Evaluation of the admission bowel status revealed that patients using diapers were in the majority before the training while toilet use increased after training. However, we did not come across any study investigating the relationship between diaper and toilet use before and after training.

Analysis of the effect of constipation status on FIM bowel and bladder showed that patients who received training reported lower rates of constipation problem and diaper use. This constipation problem/diaper use decreased after training and the results were found to be significant. Pekmezci (2013) found that training significantly decreased constipation in their study on the effect of training chemotherapy patients on their symptoms.29 Erdogan (2011) found decreased constipation frequency in cancer patients receiving chemotherapy in their study on the role of training in symptom management. 30. A planned bowel training program was explained to the subjects visited at home and resulted in decreased constipation incidence in a study conducted by Ayaz et al. in 2014. 26 Our results were consistent with the literature.

**CONCLUSION**

The results of this study significantly contribute to the literature as it is one of the few studies conducted on FIM/sphincter control in rehabilitation patients. We found that the bowel and bladder training provided by rehabilitation nurses had positive and useful effects on the sphincters and allowed the patients to independently continue their daily living activities. This knowledge is quite valuable in terms of nursing care and results.

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**Conflict Interest**

The author declares that there is no conflict of interest.

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