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Enhancing patient outcomes in home enteral nutrition through checklist-based discharge education

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ABSTRACT

Objective: This study evaluated the effectiveness of checklist-guided discharge education in reducing post-discharge complications and emergency department visits among patients receiving home enteral nutrition (HEN), and assessed its impact on caregiver competence and patient safety.

Methods: A prospective, quasi-experimental, pre-post test controlled study was conducted between November 2024 and July 2025 with 52 HEN patients and their caregivers. Participants were randomly allocated to an intervention group, which received structured, hands-on training using the *Home Enteral Nutrition Caregiver Task Checklist*, or a control group that followed routine discharge procedures. Demographic and clinical data, feeding methods, complications, and emergency department visits were tracked over three months.

Results: Baseline demographics and comorbidities were comparable between groups. The intervention group showed significantly fewer mechanical complications, including tube obstruction, dislodgement, and replacement ($p<0.05$). Gastrointestinal complications such as diarrhea, constipation, bloating, and vomiting were also reduced ($p<0.05$). Nasogastric tube users experienced more mechanical events, whereas intermittent feeding was associated with greater gastrointestinal complications. Emergency department visits were significantly lower in the intervention group ($p<0.001$), while hospital readmissions did not differ significantly. Effect size analyses revealed large effects for mechanical complications and emergency department visits, and moderate effects for gastrointestinal complications outcomes.

Conclusion: Checklist-guided discharge education is a practical and effective strategy to improve HEN management. By reducing mechanical and gastrointestinal complications and lowering emergency department visits, structured education enhances caregiver competence, strengthens patient safety, and promotes more sustainable home care.

Keywords: enteral nutrition, home care services, gastrostomy, discharge education, caregivers, patient safety

Introduction

Enteral tube feeding (ETF) is recognized as an effective and reliable method of treatment for patients with a functional gastrointestinal system who are unable to meet their nutritional needs orally.[1] Conditions such as stroke, motor neuron disease, multiple sclerosis, dementia, head and neck cancers, cardiovascular diseases, burns, and trauma impair swallowing function and place patients at significant risk of malnutrition. In this context, ETF plays both a preventive and therapeutic role in the management of malnutrition.[2]

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Advances in medical technology and the expansion of home healthcare services have transformed ETF from a hospital-based intervention into a practice increasingly maintained in patients' homes with the support of caregivers. In the United States, approximately 344,000 individuals across all age groups receive ETF annually, while in Europe, 35.5% of individuals over 65 years of age are reported to be managed with HEN.[3,4]Home-based ETF contributes to reduced hospital readmissions, lower healthcare costs, improved patient independence, and enhanced quality of life.[5,6] However, it is also associated with mechanical and gastrointestinal complications such as diarrhea, constipation, nausea, vomiting, tube obstruction, tube dislodgement, aspiration, and electrolyte imbalances, which may compromise patient safety and clinical outcomes.[7]

In home ETF, caregiving responsibilities are primarily assumed by family members. The knowledge, attitudes, and practices of caregivers are closely linked to patient safety. Yet, the literature highlights frequent knowledge gaps among caregivers in managing complications such as tube obstruction, leakage, and displacement.[8-10] Furthermore, insufficient time allocated for appropriate discharge planning often leave caregivers insufficiently prepared to manage ETF at home, leading to preventable complications and unnecessary healthcare utilization.[11]

Evidence-based discharge education has been shown to enhance caregiver knowledge and skills, reduce anxiety, and lower complication rates.[12-14] In enterally fed populations, these programs have been shown to lower complication rates, enhance recovery, and prevent unplanned hospital readmissions. For instance, systematic nursing interventions reduced the incidence of diarrhea, abdominal distension, and constipation in children receiving ETF compared with control groups.[15] Similarly, comprehensive educational tools, such as brochures and instructional videos, have been shown to significantly improve caregivers' competence in managing nasogastric feeding, resulting in lower complication rates.[15,16] Studies conducted in Taiwan and the United Kingdom further demonstrate that standardized discharge education leads to fewer complications after gastrostomy placement, underscoring the importance of sustained and structured training programs in preventing adverse outcomes.[13,16] Multivariate analyses also confirm that participation in hospital–community–family education programs serves as a protective factor for patient prognosis.[12] Beyond clinical outcomes, standardized education has been shown to ease caregiver burden by reducing stress and anxiety, thereby supporting the continuity of home care.[13]

In Türkiye, studies on home ETF have largely focused on identifying the educational needs of patients and caregivers.[17] However, the potential impact of discharge education supported by structured tools—such as checklists—on patient outcomes, complication rates, and hospital readmissions remains insufficiently explored. This gap underscores the necessity of generating locally relevant, evidence-based data to guide clinical practice.

Accordingly, the present study aims to evaluate the effects of checklist-guided discharge education on the outcomes of patients receiving home ETF. We hypothesize that the use of standardized checklists will enhance caregiver competence, reduce preventable complications, improve patient safety, and minimize unnecessary hospital readmissions.

Main Points

- Checklist-guided discharge education significantly reduces post-discharge mechanical and gastrointestinal complications in home enteral nutrition patients.
- Structured, hands-on caregiver training enhances caregiver competence and strengthens patient safety during the early post-discharge period.
- Systematic discharge education markedly decreases enteral feeding–related emergency department visits.
- Percutaneous endoscopic gastrostomy (PEG) feeding is associated with fewer mechanical complications than nasogastric tubes, while intermittent feeding increases gastrointestinal risks, highlighting the need for tailored feeding strategies.

Materials and Methods

This quasi-experimental, pre-post test controlled study was conducted between November 2024 and July 2025 with patients receiving HEN and their caregivers at the Palliative Care Unit of Sabuncuoğlu Training and Research Hospital in Amasya, Turkey. Inclusion criteria included patients aged ≥18 years receiving HEN along with their family caregivers, whereas healthcare professionals providing care were excluded. Collected data included patient and caregiver characteristics, feeding methods, and clinical outcomes such as gastrointestinal symptoms, tube-related complications, and unplanned emergency admissions.

Data collection tools

In this study, data were collected using a Data Collection Form designed by the researcher based on a review of the literature. This form included the sociodemographic characteristics of patients and caregivers, as well as the clinical outcomes of patients receiving enteral nutrition.[17,18] For discharge education, the Home Enteral Nutrition Caregiver Task Checklist was used. This scale was originally developed by Silver et al. (2004), with a reported Cronbach's alpha of 0.94. In the Turkish adaptation, the Cronbach's alpha was 0.75.[17,19] The checklist consists of 33 items in four subdimensions: technical tasks, nutrition-related tasks, care management tasks, and functional tasks.

Intervention and control groups

Participants were randomly assigned to an intervention or control group. Randomization was performed using a simple random allocation table, and patients were assigned to groups based on this table. Group homogeneity was ensured with respect to age. The intervention group received standardized, hands-on discharge education, with the Home Enteral Nutrition Caregiver Task Checklist used as one of the tools within this structured training. The control group received routine discharge education, which included guidance on the type and amount of food and fluids to be provided, methods for measuring these amounts, and the regulation of feeding frequency and timing throughout the day. Instructions also covered maintaining the patient's head in an elevated position during feeding and pausing the administration if oral intake occurred. Additionally, caregivers were given the opportunity to practice the feeding procedures. Post-discharge follow-up was conducted via telephone for three months, with outcomes systematically recorded. The study was completed with 52 patients (26 per group), excluding 15 participants due to intensive care unit (ICU) transfer, discontinuation of enteral feeding, or death.

Education and follow-up process

Data were collected through face-to-face interviews conducted by the researcher. All patients and caregivers were provided with verbal and written information regarding the purpose and procedures of the study, and written informed consent was obtained from those who agreed to participate. Caregivers in the intervention group received standardized, hands-on training using the checklist, delivered by the same researcher. Training sessions were repeated at least three times in the hospital prior to discharge, with the number of repetitions increased based on the caregivers' learning needs.

During the post-discharge period, communication with patients and caregivers was maintained via telephone, and they were provided with the opportunity to consult the researcher if needed. The researcher monitored and recorded patient outcomes over the three-month follow-up period through weekly phone calls.For patients and caregivers in the control group, only home visits were conducted, and subsequent follow-up was performed through telephone calls. The study was completed with a total of 52 patients, 26 in the intervention group and 26 in the control group. During the follow-up period, 7 patients in the intervention group and 8 patients in the control group were excluded due to ICU readmission, discontinuation of enteral feeding, or death.

Ethical considerations of the study

Ethical approval was obtained from the Amasya University Non-Interventional Ethics Committee (ID: E-76988455-050.04-228910), and institutional permissions were secured. All participants provided written informed consent, and no interventions beyond standard care were applied.

Statistical analysis of the data

All data were analyzed using SPSS version 26.0. Continuous variables were summarized as mean ± SD, and categorical variables as frequencies and percentages. Group comparisons were conducted using the Mann–Whitney U test for continuous variables and the Chi-square test for categorical variables. Post-discharge mechanical and gastrointestinal (GI) complications at one and three months, as well as emergency visits, were analyzed with the Mann–Whitney U test. Associations between complications and patient or caregiver characteristics were evaluated using non-parametric tests. Effect sizes were calculated with Cohen's d for continuous outcomes and effect size r for non-parametric comparisons, interpreted as small (d = 0.2), moderate (d = 0.5), and large (d ≥ 0.8).

Results

Sociodemographic and clinical characteristics

The demographic and clinical characteristics of the participants are presented in Table 1. In the intervention group, 65.4% of patients were female, compared with 61.5% in the control group ($p > 0.05$). The mean age was 79.46 ± 13.97 years in the intervention group and 76.73 ± 21.12 years in the control group. Hypertension, diabetes, and cardiovascular diseases were the most common comorbidities, each present in 50% of participants. Stroke and dysphagia were the leading indications for ETF, accounting for 50% and 46.2% of cases in the intervention and control groups, respectively. All patients in the intervention group were fed via percutaneous endoscopic gastrostomy (PEG), whereas 69.2% of control patients used PEG and 30.8% used nasogastric tubes.

Post-discharge mechanical complications

During the three-month follow-up, the most frequent mechanical complications were tube replacement (59.6%), tube obstruction (53.8%), and tube dislodgement (25%). Comparison between groups demonstrated significant differences in tube obstruction (Month 1: $Z = -5.761$, $p<0.001$; Month 3: $Z = -4.808$, $p<0.001$), tube dislodgement (Month 1: $Z = -2.693$, $p = 0.007$; Month 3: $Z = -2.161$, $p = 0.031$), tube replacement (Month 3: $Z = -4.990$, $p <0.001$), and total mechanical complications (Month 1: $Z = -5.433$, $p<0.001$; Month 3: $Z = -5.120$, $p<0.001$) (Table 2).

Post-discharge gastrointestinal complications

Gastrointestinal complications (GI) were also reduced in the intervention group compared with controls. At one month, significant differences were found in diarrhea ($Z = -3.877$, $p <0.001$) and abdominal distension ($Z = -3.045$, $p = 0.002$). At three months, constipation ($Z = -2.722$, $p = 0.006$), diarrhea ($Z = -5.664$, $p <0.001$), abdominal distension ($Z = -3.403$, $p = 0.001$), and overall GI complications ($Z = -2.778$, $p = 0.005$) were significantly lower in the intervention group (Table 3).

Association of complications with patient and caregiver characteristics

No significant differences in mechanical or GI complications were observed based on patient age,

Table 1. Sociodemographic and Clinical Characteristics of Patients and Caregivers.

	Intervention Group	**Control Group**
Patient Gender	N (%)	N (%)
Female	17 (65.4)	16 (61.5)
Male	9 (34.6)	10 (38.5)
Patient Age (Mean ± SD)	79.46±13.97	76.73±21.12
Chronic Diseases		
Hypertension, Diabetes, Cardiovascular	13 (50)	13 (50)
COPD, Cardiovascular	4 (15.4)	3 (11.5)
Parkinson, Dementia	2 (7.7)	7 (26.9)
Alzheimer	4 (15.49	3 (11.5)
Indication for Enteral Nutrition	N (%)	N (%)
Stroke, Dysphagia	13 (50)	12 (46.2)
Parkinson-Dementia	3 (11.5)	7 (26.9)
Geriatric Conditions	5 (19.2)	5 (19.2)
Alzheimer	5 (19.2)	2 (7.7)
Type of Tube		
PEG	26	18
NG	-	8
Feeding Method		
Continuous infusion	14 (53.8)	12 (46.2)
Intermittent	12 (46.2)	14 (53.8)
	Intervention Group	**Control Group**
Caregiver Gender	N (%)	N (%)
Female	19 (73.1)	21 (80.77)
Male	7 (26.9)	5 (19.23)
Caregiver Age (Mean ± SD)	**79.46±13.97**	**76.73±21.12**
Marital Status		
Married	22 (84.6)	22 (84.6)
Single	4 (15.4)	4 (15.4)
Education Level		
Illiterate	1 (3.8)	1 (3.8)
Literate	2 (7.7)	-
Primary	11 (42.3)	19 (73.1)
Secondary	9 (34.6)	6 (23.1)
University	3 (11.5)	-

Table 1. Continued

	Intervention Group	Control Group
Occupation		
Housewife	14 (53.8)	21 (80.77)
Retired	5 (19.2)	1 (3.8)
Civil Servant	4 (15.4)	3 (11.5)
Worker	3 (11.5)	1 (3.8)
Relation to Patient		
Relative	24 (92.3)	25 (96.2)
Paid caregiver	2 (7.7)	1 (3.8)
Previous Experience		
Yes	2 (7.7)	4 (15.4)
No	24 (92.3)	22 (84.6)
Sufficiency of Enteral Nutrition		
Yes	6 (23.1)	19 (73.1)
Partly	18 (69.2)	6 (23.1)
No	2 (7.7)	1 (3.8)

sex, or comorbidities (p> 0.05). However, mechanical complications were significantly higher among patients with nasogastric tubes compared with PEG (Z = –2.286, p = 0.022), and GI complications varied significantly by feeding method, with intermittent feeding associated with more GI events (Z = –2.754, p = 0.006). No significant relationship was found between the caregiver's sex, education level, occupation, and prior caregiving experience and mechanical or gastrointestinal complications (p> 0.05), whereas a significant positive correlation was observed between age and mechanical problems (p <0.05) (Table 4).

Healthcare utilization: Emergency visits and rehospitalizations

A significant difference was observed in enteral feeding–related emergency department visits between groups (Z = –5.059, p < 0.001). In the intervention group, reasons for emergency visits included tube obstruction (7.7%), tube dislodgement (7.7%), constipation (7.7%), and diarrhea (7.7%). In contrast, the control group presented more frequently with tube obstruction (50%), tube dislodgement (50%), vomiting (34.6%), and diarrhea (19.2%). No statistically significant difference was found between groups for hospital readmissions (Z = –0.730, p = 0.465) (Table 5).

Effect sizes (Cohen's d)

Cohen's d values indicated large clinical effects for mechanical complications (d = 1.788, effect size r = 0.666) and emergency visits (d = 1.548, r = 0.612), as well as a moderate effect for GI complications (d = 0.794, r = 0.368). The effect size for hospital readmissions was small (d = 0.259, r = 0.128). These findings suggest that checklist-guided discharge education produced moderate-to-large reductions in post-discharge mechanical and GI complications and emergency visits, while no meaningful effect was observed for hospital readmissions.

Table 2. Mechanical Problems After Discharge.

Problems	Intervention Group	Control Group	Z	p
1st Month				
Tube obstruction	14.54	37.02	-5.761	<0.001
Tube dislodgement	21.26	30.56	-2.693	0.007
Total mechanical problems	14.90	36.67	-5.433	<0.001
3rd Month				
Tube obstruction	16.54	35.10	-4.808	<0.001
Tube dislodgement	22.50	29.37	-2.161	0.031
Tube replacement within 3 months	15.94	35.67	-4.990	<0.001
Total mechanical problems	15.12	36.46	-5.224	<0.001

*Z, Mann–Whitney U test; p, significance level; *p < 0.05*

Table 3. Gastrointestinal Problems After Discharge.

Problems	Intervention Group	Control Group	Z	p
1st Month				
Diarrhea	18.18	33.52	-3.877	<0.001
Bloating	19.72	32.04	-3.045	0.002
3rd Month				
Constipation	20.50	31.29	-2.722	0.006
Diarrhea	15.00	36.58	-5.664	<0.001
Bloating	18.96	32.77	-3.403	0.001
Total gastrointestinal problems	20.12	31.65	-2.778	0.005

*Z, Mann–Whitney U test; p, significance level; *p < 0.05*

Table 4. Associations of Mechanical and Gastrointestinal Problems with Various Variables.

	Total Mechanical Problems		Total Gastrointestinal Problems	p
Patient Age	r=0.112	0.430*	r=0.001	0.993*
Caregiver Age	r=0.343	**0.013***	r=-.064	0.654*
Patient Gender	**Mean Rank**	**Z/p**	**Mean Rank**	**Z/p**
Female	25.79	-.455	27.29	0.495
Male	27.74	0.649*	25.13	0.620*
Type of Tube				
PEG	24.49	-2.286	25.84	-0.738
NG	37.56	**0.022***	30.13	0.461*
Feeding Method				
Continuous infusion	24.70	-1.101	21.94	-2.754
Intermittent	29.38	0.271*	33.80	**0.006***
Caregiver Gender				
Female	27.13	-0.710	27.76	-1.411
Male	23.06	0.478*	19.56	0.158*
Previous Experience				
Yes	29.00	-0.438	22.33	-0.718
No	26.17	0.662*	27.04	0.473*
Education Level	**Mean Rank**	**K/p**	**Mean Rank**	**K/p**
Illiterate	21.75	5.048	28.50	5.048
Literate	13.75	0.282*	11.50	0.074*
Primary	30.23		27.83	
Secondary	22.17		29.70	
University	22.50		5.83	
Occupation				
Housewife	29.09	6.360	27.59	1.327
Retired	17.33	0.273*	25.17	0.932*
Civil Servant	25.71		23.64	
Worker	8.50		17.50	

*r, Spearman correlation; K, Kruskal–Wallis test; Z, Mann–Whitney U test; *, significance level.

Table 5. Readmissions Related to Enteral Nutrition.

Outcomes	Intervention Group (Mean Rank)	Control Group (Mean Rank)	Z	p
Emergency department visits	15.70	35.90	-5.059	<0.001
Hospital readmissions	25.02	26.94	-0.730	0.465

*Z, Mann–Whitney U test; p, significance level; *p < 0.05*

Discussion

This study examined the effects of structured discharge education on mechanical and gastrointestinal complications and emergency visits in HEN patients. Our findings indicate that caregivers who received systematic education experienced significantly fewer post-discharge mechanical and gastrointestinal complications and reduced emergency department visits. Mechanical complications were particularly more frequent in patients using nasogastric tubes, and increased caregiver age was associated with higher risk. Effect size analyses (Cohen's d) demonstrated large effects for mechanical complications and emergency visits, and a moderate effect for gastrointestinal complications. These results underscore the critical role of structured, targeted education programs in improving HEN management and patient safety.

The mean age of our sample aligns with previous studies on home care patients.[9,20] The increasing prevalence of chronic diseases and higher disability levels with aging are key factors explaining the initiation of HEN. In our study, the most common indications were neurological disorders, oncological diseases, and elderly individuals requiring intensive care. Neurological disorders, particularly stroke, are widely reported as the primary clinical indication for HEN in the literature.[21] Gastrostomy (PEG or surgical) was used in 81.48% of patients as the enteral access method, consistent with ESPEN data showing PEG as the most frequently employed intervention (61.4%) and similar rates reported in other studies (~77%).[22,23]

Mechanical complications are common in patients receiving HEN. More than half of our patients experienced tube occlusion or replacement post-discharge, and one-quarter experienced accidental tube dislodgement. Literature reports tube occlusion rates ranging from 9% to 45%, while leakage and peristomal skin inflammation are less frequent.[7,24-26] Tube occlusion in PEG tubes is reported at 23–35%, whereas short-term NG tube use shows occlusion at 2–9% and dislodgement at 60%.[27] In our study, tube kinking and connection separations were not observed, and only one patient had peristomal infection, likely due to the three-month follow-up period. Literature indicates that 58.4% of caregivers report accidental tube dislodgement as a complications.[19,24] The first weeks post-discharge are the most challenging for caregivers, with mechanical problems most frequently reported during this period.[26,28]The implementation of a structured checklist ensures that all essential steps for safe enteral feeding are consistently communicated to caregivers, which likely contributed to the lower incidence of tube-related mechanical complications observed in the intervention group.

Mechanical complications were significantly higher in NG tube users compared to PEG users. PEG is considered the gold standard for long-term feeding due to lower complication rates and higher quality of life.[21]The findings of our study also support this information. While all patients in the intervention group were fed via PEG, approximately half of the patients in the control group used an NG tube. This situation can be considered an important reason for the higher incidence of tube dislodgement and tube replacement frequency in the control group, as well as for the statistically significant difference observed between the groups. Intermittent gravity feeding has been shown to reduce vomiting, regurgitation, constipation, diarrhea, and abdominal distension compared to bolus feeding; however, increased feeding frequency raises regurgitation risk.[29]

The most frequent GI complications in our study were bloating (69.2%), constipation (59.6%), diarrhea (48.1%), and vomiting (30.8%). Literature also reports constipation, nausea-vomiting, and diarrhea as the most common GI complications.[3,30-32] The risk of *Clostridioides difficile*-associated diarrhea is nine times higher in HEN patients compared to non-enterally fed individuals.[33] Diarrhea and vomiting associated with PEG may relate to abdominal distension and feeding volüme.[34] Enteral feeding intolerance remains common despite optimal techniques; more than 20% of patients experience nausea, vomiting, diarrhea, or bloating.[35]

No significant association was found between age or chronic diseases and mechanical or GI complications. However, patients with neurological disorders experienced more complications than those with oncological conditions.[5,36,37]

A key finding of our study is the positive effect of systematic education on unplanned emergency visits. Literature reports 20.5–37.3% readmission rates for HEN patients, primarily due to feeding intolerance, device-related problems, and sodium imbalance from dehydration.[21,38-40] Home visits and nutrition support team interventions significantly reduce readmissions and hospital stay duration.[40,41]In this context, checklist-based education provides a structured framework that enables caregivers to recognize early warning signs and respond appropriately. This approach likely contributed to the reduction in unplanned emergency visits and facilitated timely interventions at home in the intervention group.

Caregivers' knowledge and skills are critical for preventing complications and maintaining nutrition. However, advanced age may limit a caregiver's ability to acquire new knowledge and skills and apply them to complex patient care. In our study, an increase in caregiver age was associated with a higher incidence of mechanical complications in patients. This is particularly important for preventing mechanical complications that require rapid intervention. Therefore, implementing more intensive education, support, and follow-up strategies for older caregivers is crucial to reduce the risk of complications. Systematic nursing interventions effectively reduce complication rates, prevent readmissions, and decrease stress during care.[12,13,15] The home enteral tube feeding program reduced hospital and ICU stay durations and lowered annual healthcare costs.[41] Significant differences in mechanical and GI complications between the education and control groups during the first 1 and 3 months post-discharge support the effectiveness of these programs.

This study has several limitations that should be considered. First, the follow-up period was limited to the first three months after discharge, which may have restricted the observation of long-term mechanical and gastrointestinal complications. Second, the study was conducted at a single center with a relatively homogeneous sample, which may limit the generalizability of the findings to broader populations. Third, some mechanical complications were reported by caregivers rather than directly observed by researchers, introducing a potential risk of underreporting or reporting bias. Another limitation is the difference in the types of enteral feeding tubes used between the intervention and control groups. The presence of patients fed via NGT in the control group may have particularly increased the risk of mechanical complications and influenced the outcomes, representing a significant limitation of the study. Finally, although systematic education and follow-up interventions were implemented, variability in caregiver adherence and individual patient conditions could have influenced the observed outcomes. Additionally, an a priori sample size calculation was not performed, which may have affected the study's statistical power and should be considered when interpreting the results.

This study demonstrates that checklist-guided, structured discharge education significantly improves clinical outcomes and patient safety among individuals receiving HEN. Caregivers who received standardized, hands-on training experienced markedly lower post-discharge mechanical complications including tube obstruction, dislodgement, and replacement—as well as gastrointestinal complications such as diarrhea, constipation, abdominal distension, and vomiting. Moreover, enteral feeding–related emergency department visits were significantly reduced, highlighting the effectiveness of systematic education in preventing early post-discharge complications, although hospital readmissions did not differ significantly between groups. The findings underscore the critical role of caregiver competence in HEN management, as structured education enhances caregivers' ability to identify and manage potential complications, particularly during the early post-discharge period when patients are most vulnerable. The study further supports the superiority of PEG over nasogastric tubes for long-term feeding due to lower complication rates and improved quality of life. Additionally, intermittent feeding schedules were associated with an increased risk of gastrointestinal events, emphasizing the need for careful monitoring. Overall, checklist-based discharge education represents an effective strategy that should be integrated as standard practice in HEN programs. Such interventions not only improve clinical outcomes and patient safety but also enhance the efficiency of home care services and may reduce healthcare costs. Future research should investigate long-term effects, multicenter implementation, and cost-effectiveness to further validate and generalize these findings. Overall, checklist-based discharge education represents an effective strategy that should be integrated as a standard practice within HEN programs. Such interventions not only enhance clinical outcomes and patient safety but also

improve the efficiency of home care services and may contribute to reduced healthcare costs. Future research should explore the long-term effects, multicenter implementation, and cost-effectiveness of checklist-guided education to further validate and generalize these findings.

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Ethical approval

This study has been approved by the Amasya University Non-Interventional Ethics Committee (approval date 26/11/2024, number E-76988455-050.04-228910). Verbal and written consent was obtained from the patient's guardian, caregiving relative, and paid caregivers.

Author contribution

The authors declare contribution to the paper as follows: Study conception and design: AYI; data collection: AYI, BÇA; analysis and interpretation of results: AYI; draft manuscript preparation: AYI, BÇA. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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