

Clinician's Attitude to Enteral Nutrition with Percutaneous Endoscopic Gastrostomy: A Survey in China

Yijie Zhang

First Affiliated Hospital of Soochow University

Chen Ma

First Affiliated Hospital of Soochow University

Chenxi Li

First Affiliated Hospital of Soochow University

Qian Chen

Soochow University Medical College

Meifen Shen (✉ smf8165@163.com)

First Affiliated Hospital of Soochow University

Yuyu Wang

First Affiliated Hospital of Soochow University

Research article

Keywords: Percutaneous endoscopic gastrostomy (PEG), Enteral nutrition, Decision making, Attitude, Chinese doctors

Posted Date: August 10th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-54652/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Percutaneous endoscopic gastrostomy (PEG) are recommended for long-term enteral nutrition. However, long-term nasogastric (NGT) feeding is still commonplace in China. We surveyed Chinese clinicians' opinions toward PEG feeding in order to identify the potential barriers to acceptancy of PEG feeding.

Methods: A self-reported questionnaire was developed and distributed to 600 doctors. Five-point Likert scales were used for most responses.

Results: Of 525 respondents, the mainly nutritional support method was NGT while PEG was less used. Doctors working in the tertiary class A hospitals and radiotherapy department were more likely to choose PEG feeding ($p=0.000$). Overall, 241 (46%) participants do not know PEG and 284 (54%) have different understanding degree of PEG. Age ($p=0.002$), working life ($p=0.044$) and professionalism ($p=0.005$) were significantly related to the understanding of PEG. Levels of agreement was high (score of 3.47) for using PEG in patients with prolonged stroke-associated dysphagia. There was high agreement level in the statement that PEG was unnecessary when NGT could sustain the basic needs of patients, though better outcome can be predicted with PEG feeding. The listed factors influencing physicians' choice of PEG for long-term feeding scored high for all items, ranging from 3.57 to 3.89.

Conclusions: Doctors' insufficient knowledge of PEG feeding, resistance from patients and families, poor cooperation among healthcare professionals (HCPs) and between departments, and a crisis of doctor-patient trust all influence the medical decision-making process, all these factors leading physicians to prefer more conservative treatment to avoid disputes rather than better ones.

Background

Patients who suffer from prolonged dysphagia associated with head and neck cancers, stroke, and chronic neurodegenerative conditions usually require long-term enteral nutritional support with percutaneous endoscopic gastrostomy feeding tubes (PEG) instead of nasogastric feeding tubes (NGT)¹. Some studies advocated for NGT before the establishment of PEG tube feeding as it is a safer option with less risk of infection or granulation tissue formation associated with PEG tube placement²⁻⁴. Nevertheless, PEG feeding has been demonstrated in studies to have several advantages over long-term NG tube feeding, including a lower rate of complications^{4,5}, better nutritional status^{6,7} and a higher survival rate⁸. The guidelines have been revised according to the recent studies about PEG and NGT feeding in patients who need long-term enteral nutritional support⁹. 2019 American Heart Association/American Stroke Association recommends the use of NG tubes within the first 7 days and the placement of PEG in patients who are expected to be unable to swallow safely for a longer period of time (> 2–3 weeks), rather than in patients with persistent swallowing difficulties for more than 4 weeks as noted in the 2017 ESPEN guidance¹⁰. Chinese experts' consensus about Nervous system enteral

nutrition support (2019) has also adjusted the time to start PEG feeding according to the AHA/ASA guideline ¹¹.

However, the acceptance of PEG tube feeding seems to vary considerably among different countries. There is a clear contrast between Asian and Western about the attitudes toward PEG feeding of clinicians as well as the clinical practice ¹²⁻¹⁴. In North America, PEG tubes are most frequently recommended for long-term enteral nutrition by HCPs with nearly 40% of them holding the belief that PEG feeding is the standard of care for patients ¹⁵. Similarly, the use of PEG feeding tube in long-term care and community settings is now common place in European countries. Nevertheless, a survey conducted amongst residential elderly care institutions in Taiwan, 80% of patients with dysphagia were found to be on long-term NG feeding ¹³. In a research from Malaysia, the majority of elderly patients with dysphagia in residential care were found to be on long-term NG feeding, despite having inadequate calorie intake and significant malnutrition ¹⁴. Therefore, there may be a gap between the guidelines and clinical practice in Asian countries.

Numerous studies have evaluated the potential difficulties may be encountered in the practice of long-term enteral feeding with PEG tubes. Nevertheless, there are few reports about Chinese doctors' attitudes towards PEG feeding except a research published in 2018 which surveyed the opinion of radiation oncologists on PEG feeding ¹⁶. In order to identify the potential barriers to the acceptance and delivery of PEG tube feeding among clinicians in China, a survey was conducted with a questionnaire includes 11 questions about PEG decision-making process to analyze the clinicians' attitude to enteral nutrition with PEG.

Methods

Participants

In an interdisciplinary meeting, a general surgeon who places PEG tubes, a rehabilitation department physician, a speech language pathologist (SLP), a neurology registered nurse, and a neurosurgery registered nurse derived consensus on optimal decision-making practices for PEG placement. Based on published literature and experience, the work team created a questionnaire which was used in Department of Neurosurgery of the First Affiliated Hospital of Soochow University for a pilot survey and made some revisions.

Survey

Approval or written consent is not necessary because participation in the survey is on an entirely voluntary basis and consent is given by clicking the "I agree" box before answering the survey questions. Participants can withdraw at any time, responses were kept confidential and data were reported only in the aggregate.

The questionnaire surveyed the current methods of enteral nutrition mainly used in different departments, physicians' understanding of PEG, the decision-making process of PEG, and the reasons for unwilling to use PEG (Supplement Table 1). Answer options were based on 5-point Likert scales. Surveys were emailed to 600 clinicians, including general surgery, neurology, neurosurgery, rehabilitation department, general surgery, gastroenterology, oncology, radiotherapy department and others. One to two days prior to the survey distribution, messages were emailed to the physicians in order to inform them that an upcoming survey would take them about 5 minutes to complete.

Analysis

"Level of agreement" scores were reported as means and standard deviations of aggregated data based on the answer frequencies for the 5-point Likert scales (Some items were reverse coded). Chi-squared test was used to assess associations between demographic variables and understanding degree of clinicians towards PEG. Mann–Whitney U test or Kruskal–Wallis test was used for categorical variables. For post hoc analysis of differences between the 9 departments, and between different professional status of physicians, data were analyzed by one-way analysis of variance. Statistical analysis was performed by two investigators using SPSS software (version 25.0 for Windows VR (IBM SPSS, Armonk, NY: IBM Corp, USA). A two-sided analysis was used and $p < 0.05$ was regarded as statistically significant.

Results

Of the 600 questionnaires issued, 525 forms were completed correctly and the completion rates is 87.5%. 501 forms from Jiangsu Province and the others from Shanghai, Anhui, Hubei, Shanxi, Sichuan, Tianjin, Xinjiang, Zhejiang and Chongqing provinces. The average time to complete the survey was 224 seconds. The respondents are more concentrated in the age between 30–40 years old (322/61.3%) and most of them work in the tertiary class A and class B hospitals (520/99.0%). 116 participants are resident, 241 are attending, 113 are deputy chief and 55 are chief. Most doctors are bachelors (290/55.2%) and masters (181/34.5%). The details of demographic data are shown in Table 1.

Table 1
Demographic characteristics of the participants (n = 525)

Characteristic	Participants
Total,n	525
Departments, n (%)	
ICU	13 (2.5)
Neurology	45 (8.6)
Neurosurgery	27 (5.1)
Rehabilitation Dept.	40 (7.6)
General surgery	33 (6.3)
Gastroenterology	34 (6.5)
Oncology	29 (5.5)
Radiotherapy Dept.	20 (3.8)
Other	284 (54.1)
Age, years, n (%)	
20–30 years	67 (12.8)
30–40 years	322 (61.3)
40–50 years	96 (18.3)
>50 years	40 (7.6)
Educational background, n (%)	
College	10 (1.9)
Bachelor	290 (55.2)
Master	181 (34.5)
Doctor	44 (8.4)
Degree of the hospital, n (%)	
Tertiary class A hospital	134 (25.5)
Tertiary class B hospital	386 (73.5)
Secondary class A hospital	2 (0.0)
Secondary class B hospital	3 (0.0)
Working life, n (%)	

Characteristic	Participants
<3 years	34 (6.5)
3–5 years	46 (8.8)
5–10 years	188 (35.8)
>10 years	257 (48.9)
Professional level, n (%)	
Resident	116 (22.1)
Attending	241 (45.9)
Deputy Chief	113 (21.5)
Chief	55 (10.5)
Degree of understanding of PEG, n (%)	
Have no idea	124 (23.5)
Do not know	117 (22.3)
Know some of it	193 (36.8)
Know well	55 (10.5)
Very clear	36 (6.9)

Frequency of use of different enteral nutrition methods in different departments

Clinicians were asked to choose the frequency of use of different enteral nutritional methods including nasogastric tube (NGT), nasal-intestinal tube (NJT), percutaneous endoscopic gastrostomy (PEG) and percutaneous endoscopic jejunostomy (PEJ) according to their clinical reality. The options indicated frequency were range from “*never*”, “*almost never*” or “*sometimes*” to “*almost always*” or “*always*”. There was significant difference ($p = 0.000$) among the frequency of use of different nutritional methods and the result showed that NGT was more commonly used for nutritional support (Fig. 1).

Additionally, we found that nutritional decisions varied among departments (Fig. 2). Neurosurgery chose NGT as its optimal options (55.6% “*always*” choice) more often than other departments. NJT was the secondary choice which was widely accepted in ICU, neurosurgery, general surgery, gastroenterology, oncology and radiotherapy departments. Nevertheless, when it came to PEG and PEJ, the most commonly selected options were “*never*” or “*almost never*”. There was significant difference ($p = 0.000$) among departments in frequency of choosing PEG for nutritional support. Three options, “*sometimes*”,

"almost always" and "always", were selected in the radiotherapy department for the largest proportion (55.0%) of PEG feeding problems.

The nutritional decision-making also varied between different levels' hospitals (Fig. 3). Since the vast majority of doctors participating in the survey came from the tertiary class A and class B hospitals (134/386, respectively), our analysis only included these two levels. The frequency of PEG use was varied in different levels of hospitals ($p = 0.000$). The high-grade hospitals ("sometimes" & "almost always" & "always" accounted for 30.6%) were more likely to choose PEG as a long-term nutritional method for patients than the lower ones ("sometimes" & "almost always" & "always" accounted for 15.3%).

The understanding of PEG

We also investigated the 525 clinicians' knowledge about PEG, 124 (23.5%) know nothing, 117 (22.3%) don't know much, 193 (36.8%) know some, 55 (10.5%) know well and only 36 participants have a good understanding about PEG. The degree of the understanding about PEG in relation to their demographic characteristics is shown in Table 2. Age ($p = 0.002$), working life ($p = 0.044$) and professionalism ($p = 0.005$) were significantly related to the understanding of PEG. For example, clinicians with work experience ≥ 5 years, age ≥ 40 years old and a higher professional status had a better understanding of PEG. Furthermore, clinicians with a doctorate (72.7%, $p = 0.006$) degree knew more than that with other degrees (51.0%). Hospital classification and different departments also had an impact on doctors' understanding of PEG. Doctors working in higher-level hospitals (72.4%, $p < 0.001$) performed better than doctors working in secondary hospitals (47.9%) and that whose working departments were ICU (92.3%), general surgery (90.9%), oncology (82.4%) and radiotherapy (80.0%) had a deeper understanding about PEG ($p < 0.001$).

Table 2
Demographic characteristics and clinicians' understanding of PEG (n = 525)

Characteristic	Know PEG	Do not know PEG	Statistical significance	
Age				
<40 years old	195 (50.1)	194 (49.9)	0.002	
≥40 years old	89 (31.3)	47 (19.5)		
Departments				
ICU	12 (92.3)	1 (7.7)	<0.001	
Neurology	27 (60.0)	18 (40.0)		
Neurosurgery	14 (51.9)	13 (48.1)		
Rehabilitation Dep.	21 (52.5)	19 (47.5)		
General surgery	30 (90.9)	3 (9.1)		
Gastroenterology	28 (18.4)	6 (15.6)		
Oncology	24 (82.4)	5 (17.2)		
Radiotherapy Dept.	16 (80.0)	4 (20.0)		
Other	112 (39.4)	172 (60.6)		
Educational background				
College	2 (20.0)	8 (80.0)		0.006
Bachelor	148 (51.0)	142 (49.0)		
Master	102 (56.4)	79 (43.6)		
Doctor	32 (72.7)	12 (27.3)		
Degree of the hospital				
Tertiary class A hospital	97 (72.4)	37 (61.3)	<0.001	
Tertiary class B hospital	185 (47.9)	201 (52.1)		
Working life				
<5 years	35 (43.8)	45 (56.3)	0.044	
≥ 5 years	249 (56.0)	196 (44.0)		
Professional level				
Resident	51 (44.0)	65 (56.0)	0.005	

Characteristic	Know PEG	Do not know PEG	Statistical significance
Attending	126 (52.3)	115 (47.7)	
Deputy Chief	68 (60.2)	45 (39.8)	
Chief	39 (70.9)	16 (29.1)	

Insufficient knowledge of the indications and contraindications for PEG

In this part we only investigated participants who chose the options included “*know some about it*”, “*know well*” and “*very clear*” in the question about the knowledge of PEG and 284 clinicians were included at last. Table 3 emphasizes the very low scores with the statements that PEG feeding tubes are contraindicated in advanced dementia and at end of life (These two items were reverse coded items: 1 = *Always*, 2 = *Almost always*, 3 = *Sometimes*, 4 = *Almost always*, 5 = *Never*). Surprisingly, there is a high degree of consistency in the choice of nutritional support for patients with long-term dysphagia after stroke, with a score of 3.47. There were no significant differences in responses between departments, nor among different professional level of clinicians.

Table 3
Level of agreement to the use of PEG in different contexts (n = 284)

would you recommend PEG for the following patients who may need long-term nutritional support	Level of agreement Mean ± SD (scale 1–5)
1. Patients with advanced dementia.	2.92 ± 1.05
2. Patients in terminal or palliative care.	2.81 ± 1.03
3. Patients with multiple sclerosis or amyotrophic lateral sclerosis.	3.34 ± 1.06
4. Patients with maxillofacial tumor.	3.43 ± 1.01
5. For stroke patients, I will place NGT/ NJT after the diagnosis of oropharyngeal swallowing disorder. If the swallowing disorder persists for 2 weeks, I will ask the patient's wishes, consider and recommend using PEG feeding.	3.47 ± 1.00
6. Patients with intolerance of nasogastric tube and nasal jejunal tube with complications such as reflux, gastroparesis, and gastric retention.	3.56 ± 1.00
[1 = <i>Never</i> , 2 = <i>Almost never</i> , 3 = <i>Sometimes</i> , 4 = <i>Almost always</i> , 5 = <i>Always</i>]	
*1&2 item use reverse scoring: 1 = <i>Always</i> , 2 = <i>Almost always</i> , 3 = <i>Sometimes</i> , 4 = <i>Almost always</i> , 5 = <i>Never</i> .	

High degree of consistency in the decision-making process for PEG feeding tubes

For the statement about the decision-making process for PEG, the score was very high except the second item, the scores were ranging from 4.08–4.18. Table 4 lists the discussion topics and average levels of agreement for each. Clinicians reached a high consensus on the protection of patients' rights and interests for decision-making. Nevertheless, for the statement that PEG was not necessary when NGT could sustain the basic needs of patients, though better outcome can predict with PEG feeding, clinicians' score was very low (this item was reverse coded), almost half of the participants (49.9%) chose "*Somewhat agree*" and 68 (12.95%) chose "*Completely agree*". The chiefs have lower agreement than attendings ($p = 0.01$) about this item. There were no significant differences in responses among departments.

Table 4
Level of agreement with use of discussion topics in decision making (n = 284)

Do you agree with the following statement about PEG?	Level of agreement Mean ± SD (scale 1–5)
1. PEG can only be used in accordance with the patient's condition and his own wishes.	4.11 ± 0.78
2. Although patients with PEG feeding may have a better prognosis, NGT/ NJT can already sustain the basic needs of patients, there is no need for PEG.	2.37 ± 0.87
3. I will recommend the type of enteral nutrition to be used according to the patient's condition and guidelines. If it is contrary to the patient's wishes, I will communicate with them to explain the reasons for making decisions. In case of conflict, the patient's wishes shall prevail.	4.09 ± 0.72
4. If the PEG placement process can be simplified, it will be more conducive for me to make PEG decisions.	4.08 ± 0.68
5. Establishing a multi-disciplinary nutrition decision-making team will help me better choose nutrition support methods.	4.18 ± 0.71
[1 = <i>Disagree</i> , 2 = <i>Somewhat disagree</i> , 3 = <i>Neither agree nor disagree</i> , 4 = <i>Somewhat agree</i> , 5 = <i>Completely agree</i>]	
*Item 2 use reverse scoring: 5 = <i>Disagree</i> , 4 = <i>Somewhat disagree</i> , 3 = <i>Neither agree nor disagree</i> , 2 = <i>Somewhat agree</i> , 1 = <i>Completely agree</i> .	

Factors affecting doctors' choice of PEG for enteral nutrition

Table 5 shows the mainly reasons that affected clinicians to make PEG decision. All the items gained a high score which ranged from 3.57–3.89. For the statement about PEG is an invasive procedure and patients' acceptance is low, the level of agreement was very high, 3.89. There were no significant differences in responses between the departments, except that the gastroenterology group had significantly lower agreement rate than the neurology, neurosurgery, rehabilitation, general surgery group ($p = 0.018, 0.003, 0.041, 0.006$, respectively) on the statement that "PEG surgery is inconvenient, time-consuming, and requires the cooperation of an endoscopist". Additionally, deputy chiefs were significantly less likely than residents and attendings ($p = 0.017, p = 0.004$, respectively) to agree with the item of self-care after discharge for patients with PEG is inconvenience. Participants were also encouraged to supplement other reasons that had affected them, and we found that clinicians in neurology had difficulty predicting the persistence of dysphagia in stroke patients. They choose NG tube for patients' nutritional support because dysphagia may recover within 7 days and PEG is not necessary.

Table 5
Reasons that influence clinicians to make PEG decision (n = 525)

For patients who need long-term nutritional support, the reasons that affect your choice of PEG are:	Level of agreement Mean ± SD (scale 1–5)
1. The operation is inconvenient and time-consuming, and requires the cooperation of an endoscopic physician.	3.78 ± 0.83
2. PEG is an invasive procedure and patient acceptance is low.	3.89 ± 0.74
3. NGT/ NJT can sustain the basic needs of patients and PEG tube feeding is not required.	3.57 ± 0.83
4. PEG is not convenient for patients to self-care after discharge.	3.65 ± 0.87
[1 = <i>Disagree</i> , 2 = <i>Somewhat disagree</i> , 3 = <i>Neither agree nor disagree</i> , 4 = <i>Somewhat agree</i> , 5 = <i>Completely agree</i>]	

Discussion

525 forms were completed correctly in this study and the completion rate is very high (i.e. 87.5%). Although our participants are mainly from Jiangsu province and the sample size was not large, we can still find some useful information that reflects the overall opinions about PEG using for nutritional support in China.

We found that NG tube feeding was still the most commonly used method for nutritional support because it's non-invasive, convenient, fast, and affordable. In addition, the frequency of PEG use varied among different departments. Radiotherapy departments prefer to use PEG compared to other departments, possibly because nasal feeding is no longer possible for patients with advanced digestive tract or maxillofacial tumors¹⁶. Tertiary class A hospitals are better equipped, more technologically advanced, and have a stricter environment, making it more likely to choose PEG for enteral nutrition than class B hospitals. Additionally, clinicians working in high-grade hospitals have more opportunities to participate in some training programs. Hospitals' attitudes may influence clinicians' decision-making processes and limit their choices.

We then surveyed doctors' knowledge of PEG and compared them with their corresponding demographics. The result indicates that doctors' knowledge of PEG is very limited, which may lead to inappropriate decision-making. Our study found that doctors' better understanding of the benefits of PEG comes with longer work experience, higher educational background and professional level, and the grade of hospital also contributes.

There were also some contradictions. Clinicians acquired high scores in the part of indications and contraindications of PEG while when the question talked about their clinical practice, we got completely

contradictory answers. The participants in this survey had a high level of agreement about the item that stated “PEG is unnecessary if NGT can sustain patients’ needs though better outcome can predict with PEG in those patients”. This demonstrates the gap between theory and practice in Chinese clinical environment, and emphasized the importance of PEG-training in hospitals. Actually, patients with NG tube feeding cannot meet their daily calorie requirements and an inadequate intake may have led to persistence of malnutrition in these long-term feeding patients¹⁴. Complications of long-term NG tube feeding may explain the worse prognosis of these patients. Tube dislodgement and clogging lead to frequent re-insertion which may induce nasopharyngeal area trauma and insufficient energy intake¹⁷⁻¹⁹. Some studies have confirmed that prolonged feeding with NGT implied a higher risk of aspiration and pneumonia than PEG especially in those patients with stroke-associated dysphagia^{1,20,21}.

PEG feeding has many benefits for patients with long-term enteral nutrition, so why are doctors reluctant to choose it? What has influenced their decision-making? We listed four reasons that have been frequently mentioned in previous studies²²⁻²⁴, all of which had a high level of consensus in our study. The reasons listed can be divided into three domains: multidisciplinary communication is insufficient²⁵, patients and relatives’ traditional mindset²⁷ and deficiencies in knowledge about PEG tube feeding among clinicians²⁸.

Insufficient knowledge about PEG and stereotype of the nutritional supporting methods among our clinicians further affect PEG using. Educational programs and training courses related to PEG feeding are necessary for improving the lack of knowledge and skills of HCPs. For patients who need but are hesitant to use PEG for long-term nutritional support, doctors with adequate knowledge and familiarity about PEG are more persuasive and trustworthy. Furthermore, influenced by cultural contexts for millennia, Chinese doctors prefer “conservative” and “traditional” treatments. The development of clear guidelines and enforcement standards by the hospital may help to gradually change this situation. Hospital should formulate its own Enteral Nutritional Protocol according to the national guidelines to assist doctors in making decisions.

Additionally, we should notice that the decision-making process is not only involved doctors but also patients and their relatives. In our study, the resistance of patients and their families was a main obstacle for clinicians to make PEG decisions, with a score of 3.89. Similarly, this phenomenon also has been reported in several studies^{13,23,29}. We found some potential causes from our research:(1) culture stance and social values of patients; (2) insufficient communication between HCPs and patients; (3) poor multidisciplinary cooperation between doctors and nurses.

In Asian, many countries have their own social values and are profoundly influenced by their culture and social norms which made combined effect on decision-making regarding treatment and health care options. Filial piety influences Chinese families' perceptions of the body, but providing long-term nutritional needs through safer PEG feeding methods is paradoxically rejected because of concerns about loss of body integrity¹³.

On the other hand, due to the large population in China, medical resources are relatively scarce and doctor-patient relationship is tense and full of contradictions. In order to reduce unnecessary disputes, the final decision-maker of patients' treatment plan in China are their relatives instead of doctors, unlike some European countries such as England and Wales that best decisions were made by physicians³⁰. The power dynamics between doctors and patients is realigned by limiting doctors' power over patients' interests and encouraging patients to make autonomous clinical decisions for their own health³¹, which also absolves doctors of some responsibility. However, the information acquired by patients and their families were limited and communication was also not enough. Hierarchical diagnosis and treatment system have not been fully established in China, numerous patients seek medical care from large hospitals in urban areas without a referral from a primary care institution, which puts doctors working in big hospitals under heavy work pressure. They do not have much time and energy to communicate treatment plans in detail with individual patients.³² The asymmetry of medical information between physicians and patients is a crucial reason for patients' distrust of clinicians and has already affected the medical decision-making process. As a result, doctors give a suggestion and decisions are often made by patients and relatives based on inadequate information and limited medical knowledge^{30, 33, 34}. Unsurprisingly, patients and their families refused using PEG feeding for long-term nutritional support because of traditional mindset and precarious trust induced by inadequate patients-physicians interaction.

Compelling clinicians to explain all the details to patients is impractical in China's overloaded medical system. Instead, emphasis should be placed on nurse-physicians/patients communication. Doctors and nurses should supervise each other in the clinical decision-making process and conflicting opinions should be discussed in detailed rather than simply using "listening and receiving" this passive form which leads to only one-way communication and result in inappropriate decisions^{25, 35}. Nurses should play a mediating role in the transfer of information between the patients and the doctors, as they have more direct contact with patients. A previous study in southeast Asia found that the main barrier that prevented doctors from adopting a partnership style of communication was due to the social gap between people of lower and higher social levels³⁶, which can also exist in China. The reasons behind this phenomenon need further discussion and research according to the actual conditions of China.

Multidisciplinary cooperation between different departments should also be valued. Most of the participants thought the PEG inserted process was cumbersome and endoscopic assistance, so they were unwilling to use. Simplify the procedure of PEG placement and build a multidisciplinary nutrition team to help with decision-making is very imperative. Comparing with other departments, we found gastroenterology had a lower level of agreement about the statement that PEG insertion process is time-consuming maybe since that was their area of expertise.

Furthermore, for neurology physicians, a predictive tool which can help them estimate the duration of dysphagia is important to assist with artificial feeding decisions. It will support decision making for NGT or PEG insertion after ischemic stroke and is a step towards personalized medicine³⁷.

Conclusions

Our present study surveyed the attitudes of clinicians from different departments toward PEG feeding. We found three objective reasons that may influence their PEG decision-making process: (1) HCPs insufficient knowledge of PEG feeding; (2) resistance from patients and families; (3) poor cooperation among HCPs and departments. There are also some subjective factors which need further research. Actually, in addition to the traditional beliefs of Chinese physicians, the poor foundation of trust between clinicians and patients also influences the medical decision-making process and leads physicians to prefer more conservative treatment to avoid disputes rather than better ones. We speculate the vital factor for this may lie in the inevitable form of China medical system caused by the large population, such as hospitals' inappropriate internal incentives and the heavy workload of HCPs.

Limitations And Future Recommendation

This study has only explored the opinion of clinicians, while patients, relatives and societal factors undoubtedly play a role in the acceptance and use of PEG feeding. Future research should therefore explore the factors influencing decisions on the route of enteral feeding from a non-HCP perspective. Additionally, the influence of the cultural barrier and medical system limitations as well as the public health literacy to PEG feeding in China needs further study and exploration.

Declarations

Ethics approval and consent to participate

One to two days prior to the survey distribution, messages were emailed to the physicians in order to inform them that an upcoming survey would take them about 5 minutes to complete. The questionnaire begins with an informed consent section, which reads as follows:

"The opening of the survey:

Dear doctors, this questionnaire has been developed by the first affiliated hospital of Soochow University to assess clinicians' views on the use of percutaneous endoscopic gastrostomy (PEG) for nutritional support. It would be appreciated if you took time to answer the questions of this questionnaire. Please kindly note that all data will remain confidential and that you could leave the study at any stage. Prior to taking part in the study, please click on the "I agree" box to indicate your agreement to the study."

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

No funding was received for this study.

Authors' contributions

ZYJ and CM equally contributed to the conception and design of the research; LCX contributed to the design of the research; CQ contributed to the acquisition and analysis of the data; SMF and WYY contributed to the interpretation of the data; and ZYJ and MC drafted the manuscript. All authors critically revised the manuscript, agree to be fully accountable for ensuring the integrity and accuracy of the work, and read and approved the final manuscript.

Acknowledgements

Not applicable

Financial disclosure

None declared.

Conflicts of interest:

None declared.

References

1. Gomes CA, Jr., Andriolo RB, Bennett C, et al. Percutaneous endoscopic gastrostomy versus nasogastric tube feeding for adults with swallowing disturbances. *Cochrane Database Syst Rev*. May 22 2015;(5):CD008096. doi:10.1002/14651858.CD008096.pub4
2. Gomes CA, Jr., Lustosa SA, Matos D, Andriolo RB, Waisberg DR, Waisberg J. Percutaneous endoscopic gastrostomy versus nasogastric tube feeding for adults with swallowing disturbances. *Cochrane Database Syst Rev*. Nov 10 2010;(11):CD008096. doi:10.1002/14651858.CD008096.pub2
3. Ong JP, Fock KM. Oral feeding after percutaneous endoscopic gastrostomy. *J Gastroenterol Hepatol*. Jul 2010;25(7):1181-2. doi:10.1111/j.1440-1746.2010.06320.x
4. Sadasivan A, Faizal B, Kumar M. Nasogastric and percutaneous endoscopic gastrostomy tube use in advanced head and neck cancer patients: a comparative study. *J Pain Palliat Care Pharmacother*. Sep 2012;26(3):226-32. doi:10.3109/15360288.2012.702199

5. Dwolatzky T, Berezovski S, Friedmann R, et al. A prospective comparison of the use of nasogastric and percutaneous endoscopic gastrostomy tubes for long-term enteral feeding in older people. *Clin Nutr*. Dec 2001;20(6):535-40. doi:10.1054/clnu.2001.0489
6. Hamidon BB, Abdullah SA, Zawawi MF, Sukumar N, Aminuddin A, Raymond AA. A prospective comparison of percutaneous endoscopic gastrostomy and nasogastric tube feeding in patients with acute dysphagic stroke. *Med J Malaysia*. Mar 2006;61(1):59-66.
7. Kwong JP, Stokes EJ, Posluns EC, Fitch MI, McAndrew A, Vandenbussche KA. The Experiences of Patients With Advanced Head and Neck Cancer With a Percutaneous Endoscopic Gastrostomy Tube: A Qualitative Descriptive Study. *Nutr Clin Pract*. Aug 2014;29(4):526-533. doi:10.1177/0884533614532693
8. Kumagai R, Kubokura M, Sano A, et al. Clinical evaluation of percutaneous endoscopic gastrostomy tube feeding in Japanese patients with dementia. *Psychiatry Clin Neurosci*. Aug 2012;66(5):418-22. doi:10.1111/j.1440-1819.2012.02378.x
9. Powers WJ, Rabinstein AA, Ackerson T, et al. Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. Dec 2019;50(12):e344-e418. doi:10.1161/STR.0000000000000211
10. Burgos R, Bretón I, Cereda E, et al. ESPEN guideline clinical nutrition in neurology. *Clinical Nutrition*. 2018;37(1):354-396. doi:10.1016/j.clnu.2017.09.003
11. Yingying S, Suyue P, Bin P, et al. Chinese expert consensus on enteral nutrition support for neurological diseases (the second version). *Chinese Journal of Clinical Nutrition*. August 2019 2019;27(4):193-203.
12. Jaafar MH, Mahadeva S, Morgan K, Tan MP. Percutaneous endoscopic gastrostomy versus nasogastric feeding in older individuals with non-stroke dysphagia: a systematic review. *J Nutr Health Aging*. Feb 2015;19(2):190-7. doi:10.1007/s12603-014-0527-z
13. Lin LC, Li MH, Watson R. A survey of the reasons patients do not chose percutaneous endoscopic gastrostomy/jejunostomy (PEG/PEJ) as a route for long-term feeding. *J Clin Nurs*. Mar 2011;20(5-6):802-10. doi:10.1111/j.1365-2702.2010.03541.x
14. Zaherah Mohamed Shah F, Suraiya HS, Poi PJ, et al. Long-term nasogastric tube feeding in elderly stroke patients—an assessment of nutritional adequacy and attitudes to gastrostomy feeding in Asians. *J Nutr Health Aging*. Aug 2012;16(8):701-6. doi:10.1007/s12603-012-0027-y
15. Sharp HM, Shega JW. Feeding tube placement in patients with advanced dementia: the beliefs and practice patterns of speech-language pathologists. *Am J Speech Lang Pathol*. Aug 2009;18(3):222-30. doi:10.1044/1058-0360(2008/08-0013)
16. Fan L, Li J, Xiang M, et al. Attitudes of radiation oncologists to percutaneous endoscopic gastrostomy in patients with head and neck cancer and eating difficulties: A survey in China. *J Int Med Res*. May 2018;46(5):1709-1716. doi:10.1177/0300060518756244

17. Attanasio A, Bedin M, Stocco S, et al. Clinical outcomes and complications of enteral nutrition among older adults. *Minerva Med.* Apr 2009;100(2):159-66.
18. Anderson MR, O'Connor M, Mayer P, O'Mahony D, Woodward J, Kane K. The nasal loop provides an alternative to percutaneous endoscopic gastrostomy in high-risk dysphagic stroke patients. *Clin Nutr.* Aug 2004;23(4):501-6. doi:10.1016/j.clnu.2003.09.008
19. Pancorbo-Hidalgo PL, Garcia-Fernandez FP, Ramirez-Perez C. Complications associated with enteral nutrition by nasogastric tube in an internal medicine unit. *J Clin Nurs.* Jul 2001;10(4):482-90. doi:10.1046/j.1365-2702.2001.00498.x
20. Park RH, Allison MC, Lang J, et al. Randomised comparison of percutaneous endoscopic gastrostomy and nasogastric tube feeding in patients with persisting neurological dysphagia. *BMJ.* May 30 1992;304(6839):1406-9. doi:10.1136/bmj.304.6839.1406
21. Norton B, Homer-Ward M, Donnelly MT, Long RG, Holmes GK. A randomised prospective comparison of percutaneous endoscopic gastrostomy and nasogastric tube feeding after acute dysphagic stroke. *BMJ.* Jan 6 1996;312(7022):13-6. doi:10.1136/bmj.312.7022.13
22. Jaafar MH, Mahadeva S, Subramanian P, Tan MP. Perceptions of Healthcare Professionals on the Usage of Percutaneous Endoscopic Gastrostomy in a Teaching Hospital from a Middle-Income South East Asian Country. *J Nutr Health Aging.* 2017;21(4):473-479. doi:10.1007/s12603-016-0774-2
23. Yeh L, Lo LH, Fetzer S, Chen CH. Limited PEG tube use: the experience of long-term care directions. *J Clin Nurs.* Oct 2010;19(19-20):2897-906. doi:10.1111/j.1365-2702.2009.03157.x
24. Jaafar MH, Mahadeva S, Morgan K, Tan MP. Systematic review of qualitative and quantitative studies on the attitudes and barriers to percutaneous endoscopic gastrostomy feeding. *Clin Nutr.* Dec 2016;35(6):1226-1235. doi:10.1016/j.clnu.2016.04.019
25. Bryon E, Gastmans C, de Casterle BD. Nurse-physician communication concerning artificial nutrition or hydration (ANH) in patients with dementia: a qualitative study. *J Clin Nurs.* Oct 2012;21(19-20):2975-84. doi:10.1111/j.1365-2702.2011.04029.x
26. Puntillo KA, McAdam JL. Communication between physicians and nurses as a target for improving end-of-life care in the intensive care unit: challenges and opportunities for moving forward. *Crit Care Med.* Nov 2006;34(11 Suppl):S332-40. doi:10.1097/01.CCM.0000237047.31376.28
27. Tang ST, Liu TW, Lai MS, Liu LN, Chen CH. Concordance of preferences for end-of-life care between terminally ill cancer patients and their family caregivers in Taiwan. *J Pain Symptom Manage.* Dec 2005;30(6):510-8. doi:10.1016/j.jpainsymman.2005.05.019
28. Adams KM, Kohlmeier M, Powell M, Zeisel SH. Nutrition in medicine: nutrition education for medical students and residents. *Nutr Clin Pract.* Oct 2010;25(5):471-80. doi:10.1177/0884533610379606
29. Nordin N, Kamaruzzaman SB, Chin AV, Poi PJ, Tan MP. A descriptive study of nasogastric tube feeding among geriatric inpatients in Malaysia: utilization, complications, and caregiver opinions. *J Nutr Gerontol Geriatr.* 2015;34(1):34-49. doi:10.1080/21551197.2014.998326
30. Baker R, Wu AW, Teno JM, et al. Family satisfaction with end-of-life care in seriously ill hospitalized adults. *J Am Geriatr Soc.* May 2000;48(S1):S61-9. doi:10.1111/j.1532-5415.2000.tb03143.x

31. Gong N, Zhou Y, Cheng Y, et al. Practice of informed consent in Guangdong, China: a qualitative study from the perspective of in-hospital patients. *BMJ Open*. Oct 3 2018;8(10):e020658. doi:10.1136/bmjopen-2017-020658
32. Tucker JD, Wong B, Nie JB, Kleinman A, Patient-Physician Trust T. Rebuilding patient-physician trust in China. *Lancet*. Aug 20 2016;388(10046):755. doi:10.1016/S0140-6736(16)31362-9
33. Healy S, McNamara E. Tube feeding controversial patients: what do dietitians think? *J Hum Nutr Diet*. Dec 2002;15(6):445-53. doi:10.1046/j.1365-277x.2002.00398.x
34. Mitchell SL, Berkowitz RE, Lawson FM, Lipsitz LA. A cross-national survey of tube-feeding decisions in cognitively impaired older persons. *J Am Geriatr Soc*. Apr 2000;48(4):391-7. doi:10.1111/j.1532-5415.2000.tb04696.x
35. Oberle K, Hughes D. Doctors' and nurses' perceptions of ethical problems in end-of-life decisions. *J Adv Nurs*. Mar 2001;33(6):707-15. doi:10.1046/j.1365-2648.2001.01710.x
36. Claramita M, Nugraheni MD, van Dalen J, van der Vleuten C. Doctor-patient communication in Southeast Asia: a different culture? *Adv Health Sci Educ Theory Pract*. Mar 2013;18(1):15-31. doi:10.1007/s10459-012-9352-5
37. Galovic M, Stauber AJ, Leisi N, et al. Development and Validation of a Prognostic Model of Swallowing Recovery and Enteral Tube Feeding After Ischemic Stroke. *JAMA Neurol*. May 1 2019;76(5):561-570. doi:10.1001/jamaneurol.2018.4858

Figures

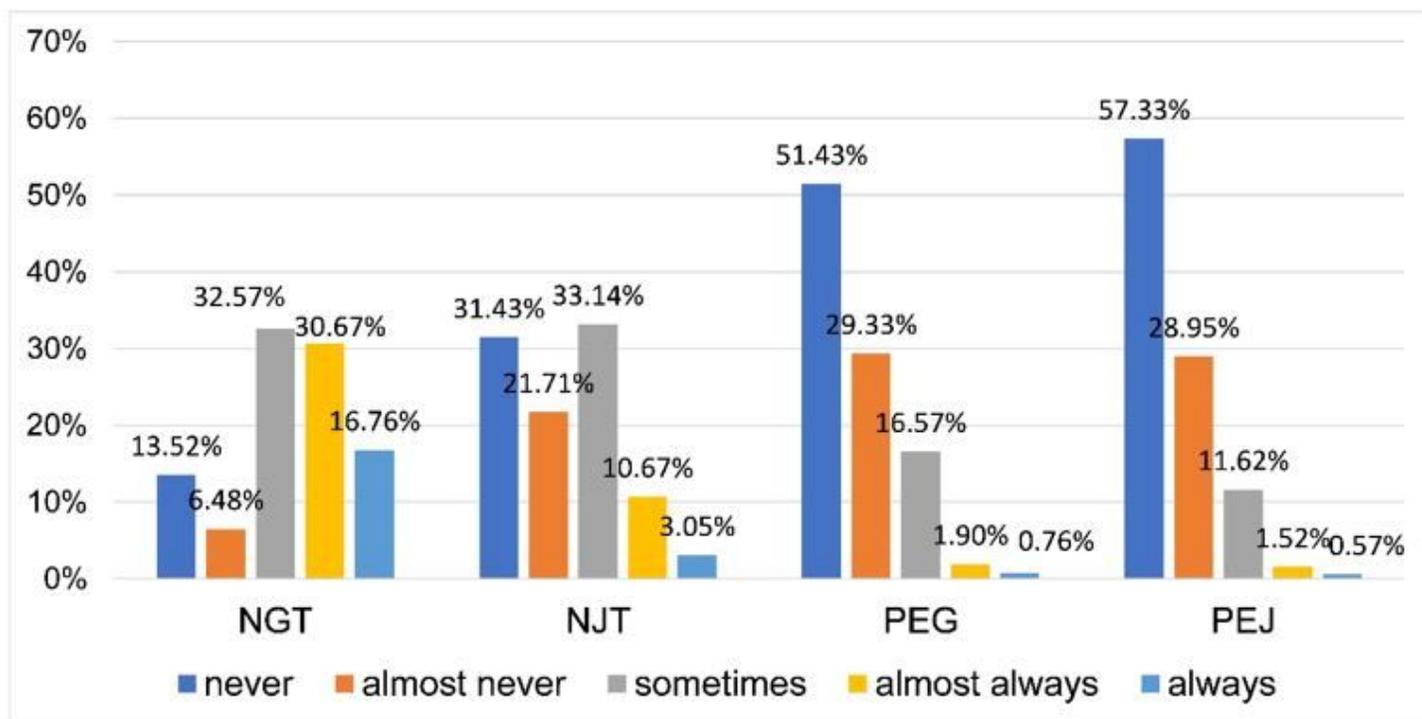


Figure 1

Frequency of use of different enteral nutritional methods

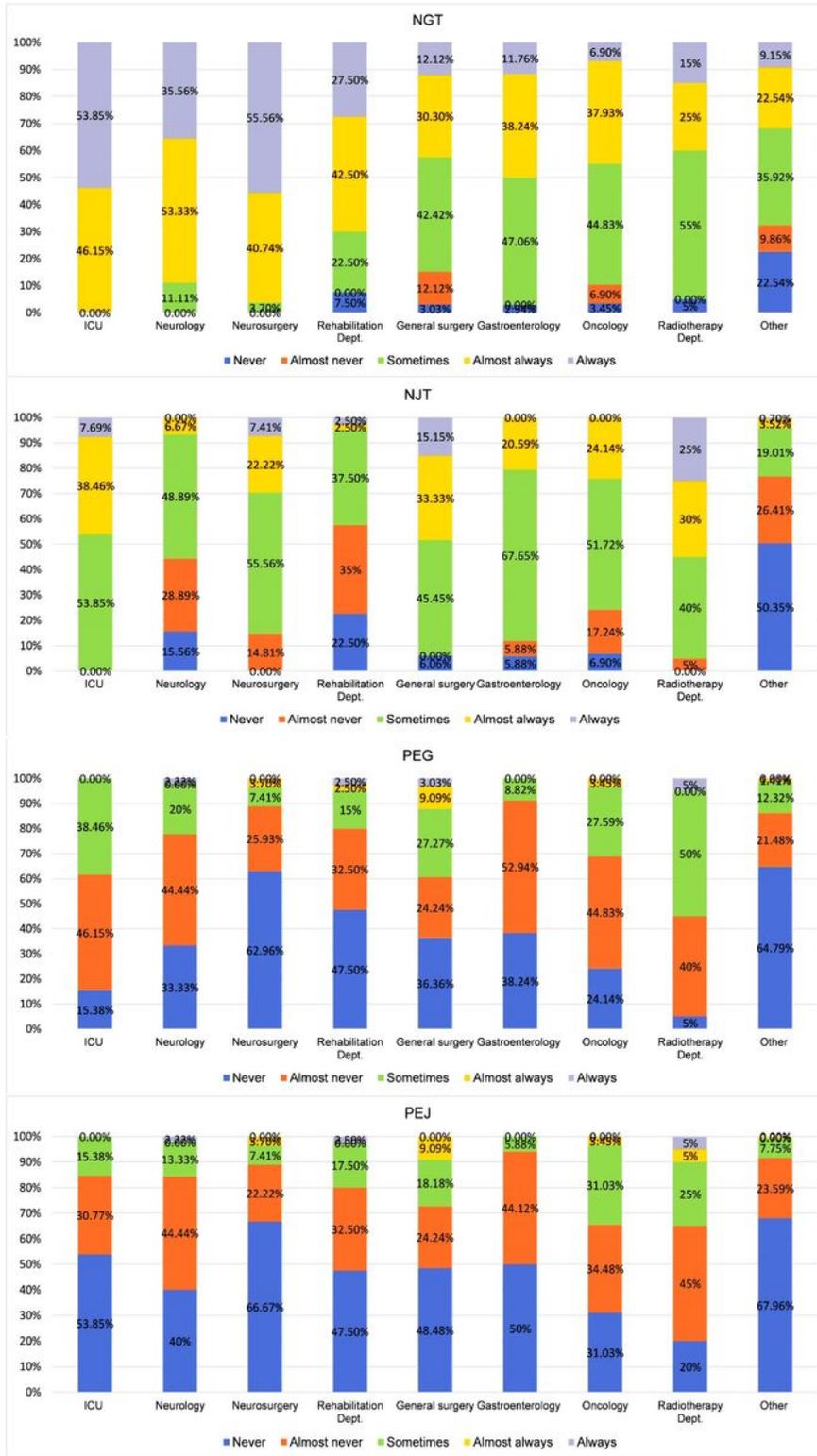


Figure 2

Nutritional decisions of different departments

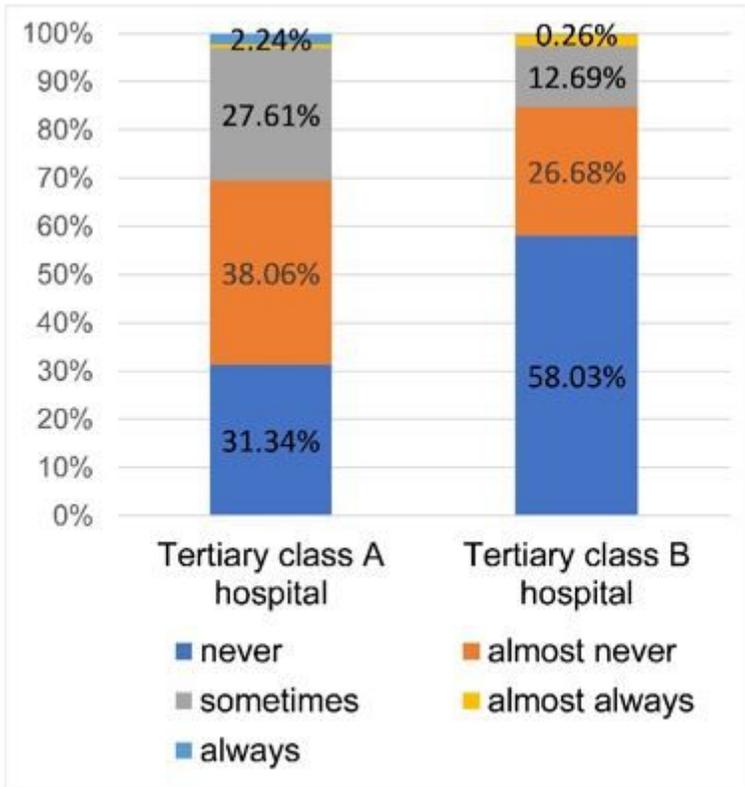


Figure 3

Frequency of PEG using in different level hospital

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryTable.1Questionnaire.docx](#)
- [Figures.rar](#)