

## The Level of Knowledge about Dysphagia Among Neurological and Internal Medicine Nurses

### Poziom wiedzy na temat dysfagii wśród pielęgniarek neurologicznych i internistycznych

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#### Abstract

**Introduction.** Dysphagia is defined as swallowing disorders which causes malnourished, aspiration pneumonia and increased number of deaths. The best method to diagnose dysphagia are screening tests. Due to the tests it is possible to introduce an accurate therapy and make a team of therapists to participate in. According to the information the knowledge about this kind of dysfunction is important among nurses.

**Aim.** The main goal of my diploma project was to measure the level of knowledge about dysphagia among the nurses from neurological and internal wards.

**Material and Methods.** The scientific method, which has been used to make the research was diagnosis sounding including the surveys. Research tool which has been used while the research was especially made and dedicated for my project own questionnaire of surveys.

**Results.** In the research have taken a part 70 nurses in the age over 22 year-old, who are active in their jobs and work at neurological and internal wards in the hospitals of Gdańsk. The research has proved higher knowledge level of the nurses working at neurological wards. All the surveyed people showed the knowledge about the definition of dysphagia as well as about the food which every sick person should consume and avoid.

**Conclusions.** Own research has shown that the garden of respondents does not affect the level of knowledge about dysphagia. The age of the respondents shows no relation to the level of nurses' knowledge about dysphagia. In turn, seniority affect the knowledge of nurses in this area. The greater the seniority, the higher the level of knowledge of the topic in the field of dysphagia. Similarly the workplace. Neurological nurses were characterized by a higher level of knowledge about dysphagia than nurses from internal medicine departments, while the level of knowledge about dysphagia does not depend on the education of the nurses surveyed. (JNPN 2021;10(1):10–17)

**Key Words:** dysphagia, internal, level of knowledge, neurological ward, nurses

#### Streszczenie

**Wstęp.** Dysfagia to zaburzenia połykania powodujące niedożywienie, zachłystowe zapalenie płuc oraz zwiększają śmiertelność. W celu szybkiego rozpoznania dysfagii, pomocne są przesiewowe testy do wykrywania zaburzeń połykania. Dzięki nim, można wprowadzić odpowiednią terapię, w której uczestniczy cały zespół terapeutyczny. Dlatego niezwykle ważna jest wiedza pielęgniarek na temat zaburzeń połykania.

**Cel.** Celem pracy była ocena poziomu wiedzy na temat dysfagii wśród pielęgniarek oddziałów neurologicznych i wewnętrznych.

**Materiał i metody.** Metodą badawczą, która została wykorzystana do przeprowadzenia badania był sondaż diagnostyczny wraz z techniką ankietową. Narzędziem badawczym, jakim się posłużono podczas badania był autorski kwestionariusz ankiety.

**Wyniki.** W badaniu wzięło udział 70 pielęgniarek w wieku od 22 roku życia, które czynnie pracują w zawodzie w gdańskich szpitalach — oddziałach neurologicznych i wewnętrznych. Badanie wykazało wyższy poziom wiedzy wśród pielęgniarek zatrudnionych w oddziałach neurologicznych. Wszystkie badane osoby wykazały wiedzę, dotyczącą definicji dysfagii oraz pokarmów jakie powinien spożywać pacjent, a czego powinien unikać chory z dysfagią.

**Wnioski.** Badania własne wykazały, że płeć respondentów nie wpływa na poziom wiedzy na temat dysfagii. Wiek osób badanych nie wykazuje związku z poziomem wiedzy pielęgniarek na temat dysfagii. Z kolei staż pracy rzutuje na wiedzę pielęgniarek w tym obszarze. Im większy staż pracy, tym wyższy poziom wiedzy badanych w zakresie dysfagii. Podobnie miejsce pracy. Pielęgniarki neurologiczne charakteryzowały się wyższym poziomem wiedzy na temat dysfagii niż pielęgniarki z oddziałów internistycznych. Natomiast poziom wiedzy na temat dysfagii nie zależy od wykształcenia badanych pielęgniarek. (PNN 2021;10(1):10–17)

**Słowa kluczowe:** dysfagia, oddział internistyczny, poziom wiedzy, oddział neurologiczny, pielęgniarki

## Introduction

Swallowing is a complex process that moves food from the mouth to the stomach [1]. Swallowing causes unconditional neuromuscular contractions managed and controlled by the central nervous system [2]. This process involves 25 muscle groups, three cervical nerves (C1–C3), and five pairs of cranial nerves (V, VII, IX, X, XII) [3] and can be divided into three phases: I — oral, II — pharyngeal, III — oesophageal.

The term dysphagia comes from the Greek words “phagia” — eat and “dys” — with difficulty [4]. Dysphagia means disorders of swallowing solid food, liquids, as well as saliva [5] at any stage, starting from taking a food bite into the mouth, through keeping it in the mouth, chewing and forming a bite, to transporting a bolus from the mouth through the throat and oesophagus to the stomach [6]. Swallowing disorders may, in isolation, refer to the consumption of solid food without any difficulties in the consumption of liquid food, or may concern only the consistency of the liquid [7].

Assuming the criterion of the pathological stage, dysphagia is divided into oropharyngeal (upper) and oesophageal (lower) [8]. Oropharyngeal dysphagia manifests itself within seconds after ingestion [9]. In upper dysphagia, swallowing disorders refer to the first and/or second phase of swallowing and manifest mainly during the intake of fluids, less often solid foods [2].

The most common causes of dysphagia in the general population include neurological diseases, including: strokes, neurodegenerative diseases, injuries and brain tumours. Swallowing disorders may occur in the case of neurological diseases of a progressive nature, as well as those with sudden onset [9,10]. Dysphagia can also occur in the course of inflammation and/or mycosis of the mouth, pharynx and oesophagus. After surgery and irradiation in the head and neck area, tissue fibrosis may occur, which reduces the mobility of the tongue and creates a narrowed oesophagus [11].

The neurogenic causes of dysphagia include: paresis of the muscles involved in swallowing, impaired coordination of the phases of swallowing, impaired sensation in the oral cavity. Swallowing problems due to neurological reasons most often concern the oropharyngeal phases [12].

Dysphagia does not always produce characteristic symptoms that could be self-diagnosed by the patient [13]. Alarm symptoms include coughing, voice changes and choking. It is also worth paying attention to the symptoms that indicate disturbances in the transport of food bolus, keeping a bite in the cheeks, leakage of saliva from the mouth [14]. A common symptom of swallowing disorders is aspiration of secretions and aspiration of saliva [2].

Swallowing disorders may be evidenced by malnutrition, recurrent respiratory infections, low-grade fever or fever of unclear aetiology. Disturbing symptoms are also the inability to cough on command, the presence of dysarthria, dysphonia and changing voice quality, i.e. moist and gurgling voice, pain behind the breastbone and a burning sensation. This ailment is usually described by patients as heartburn, which is often alleviated by swallowing saliva or taking food [9,11]. In people with oropharyngeal dysphagia, weakening of the pharyngeal and palatal reflexes and poorer mobility of the tongue are observed [15]. Specific symptoms are also the prolonged time of the meal and the penetration of the bite into the nose, which causes sneezing and leakage of food from the nose [6].

Symptoms in dysphagia can be divided into the following:

1. occur while eating meals:
  - choking, coughing,
  - sneezing,
  - leakage of foods or fluids through the nose or mouth,
  - problems with chewing (extended meal time, fast fatigue and lack of strength while eating),

- pain when swallowing (heartburn),
  - leakage of saliva from the mouth also between meals,
  - frequent clearing of your throat,
  - a sensation of food lingering in the throat,
  - after swallowing food, a feeling of the food returning to the mouth or nose [13].
2. are a consequence of dysphagia [13].
- more secretion from the respiratory tract,
  - frequent, recurring respiratory infections,
  - unexplained low-grade fever,
  - malnutrition,
  - dehydration,
  - unconditional weight loss (about 5% over 3 months) [13].

In order to implement appropriate management, it is important to perform an ingestion test [5]. It is one of the elements of a neurological examination carried out by a neurologist or neuro-speech therapist [12]. Screening assessment of swallowing (so-called swallowing screening) performed by the nurse after admitting the patient to the ward is also an important procedure [8].

One of the basic methods of diagnosing dysphagia is observation, the aim of which is the early diagnosis of symptoms of dysphagia. During observation, attention should be paid to: motivation to perform activities, speed of tasks performed by the patient, external appearance of the sick person (body weight), the ability to focus attention on the activities performed, the level of oral hygiene, and non-verbal communication [16].

Another method for diagnosing dysphagia is an interview with the patient and/or caregiver [17]. The interview should provide information about comorbidities, symptoms, and whether the patient's diet has changed during the course of the disease. Slowly developing dysphagia may be unnoticed by the patient and the symptoms appear normal. It is also worth asking about the medications taken, as some of them may affect the level of muscle tension and, consequently, the act of swallowing [2,17].

Due to the fact that an interview containing all symptoms of dysphagia and its consequences takes a long time, screening questionnaires were introduced to facilitate screening diagnostics [9]. The ability to conduct research with test tools depends on the condition of the sick person. Many neurological patients suffer from disturbances of consciousness, therefore it is often difficult to establish verbal contact with them [12].

Among the tools for assessing swallowing, the following are distinguished:

- Questionnaire tests (e.g. Eating Assessment Tool EAT-10),
- Observational test (e.g. Crary),
- Tests with test consistency (e.g. 90 ml water de Pippo test, GUSS test).

The questionnaires enable an objective assessment of the occurring dysphagia and the degree of their severity [6]. The prerequisite for the swallowing assessment is the patient's condition (the patient must be stable in circulation and respiration), the possibility of establishing contact with the patient for a minimum of 15 minutes, and accepting the patient's semi-sitting or sitting position, necessary for the swallowing assessment [17]. Nurses working in stroke units play an important role in the evaluation of dysphagia. They screen for swallowing in people who have had a stroke. The most commonly used test in clinical practice is the De Pippo test with 90 ml of water. It is recommended to perform this test not later than 24 hours after admitting the patient to the stroke unit and not later than before administering the first food, fluids or drugs orally [8].

In addition to screening tests, which are performed on the basis of clinimetric tools, specific instrumental tests are also used to assess swallowing disorders. These are usually VFSS video fluoroscopy and FESS endoscopic swallowing [9].

The aim of the research was to assess the level of knowledge of nurses employed in internal medicine and neurology departments on swallowing disorders (dysphagia).

## Material and Methods

The research method that was used in the following study was a diagnostic survey with a questionnaire technique. A research tool was used, which was the original questionnaire, which was created for the purpose of conducting the study. The questionnaire consisted of two parts — sociodemographic and questions about the knowledge about dysphagia. Questions were answered anonymously and voluntarily.

The analysis was performed with the use of statistical calculations, which were carried out using the statistical program R, version 3.6.3., as well as the Excel spreadsheet. Variables of the type were used:

- Qualitative — the number and percentage values,
- Quantitative — arithmetic mean, median and standard deviations.

The relationship between the "Experience" trait and the "Test score" trait was checked with the Pearson correlation test. The Wilcoxon test was used to determine the relationship between the "Test score" trait and the "Workplace" trait. The Kruskal–Wallis test was performed between the "Test score" trait and the "Education" trait.

## Results

The study covered nurses from neurological and internal (internal medicine) departments employed in hospitals in Gdańsk. The study lasted from February to April 2020. Appropriate permits for the research were obtained. 70 nurses participated in the study. 34 nurses from the neurological ward and not much more, 36 nurses from internal wards participated in the study. Thus, both study groups are comparable in terms of the number of respondents. Statistical analysis showed that the workplace has an impact on the level of knowledge about dysphagia ( $p < 0.001$ ).

Among the surveyed, the largest number of nurses was in the 46–51 age group. Only 4.3% of the subjects were  $\geq 58$  years of age. The youngest person under study was 22 years old, while the oldest one was 60 years old. The average age of the surveyed nurses was 44 years.

With regard to education, the largest number of people graduated from undergraduate studies (30%), 28.57% — medical secondary school. The smallest number of respondents had higher vocational education (BA in nursing) combined with a specialization (2.86%). 11 subjects completed master's studies in nursing, and 8 people had a master's degree in nursing and additionally completed specialization training.

Taking into account the length of service, the greatest number of respondents declared work experience in the range of 25–30 years. On the other hand, six respondents had work experience in the range of 5–10 years and 10–15 years. The average length of service was 21.64 years. Statistical analysis showed that seniority affects the level of knowledge about dysphagia ( $r = 0.248$ ,  $p = 0.042$ ).

The second part of the questionnaire referred to the knowledge of nurses about dysphagia. In the first question, the respondents were asked about the definition of dysphagia. All subjects from the neurological departments as well as from the internal departments gave the correct answer.

Respondents from neurology departments, when asked about the most common cause of dysphagia, almost all (97.1%) correctly indicated that strokes were the most common cause. Only 2.9% of respondents answered that the most common causes are head and neck cancers. Slightly more than half of the surveyed internal branches (55.6%) answered this question correctly. In contrast, almost 30% of nurses replied that the most common cause of dysphagia is multiple sclerosis. The rest, i.e. 13.8% of people, answered — head and neck cancers.

The respondents were also asked about the most serious complications of dysphagia. Nearly 100% of nurses from neurological departments (97.1%) correctly indicated aspiration pneumonia. The same answer was given by half of the nurses from internal departments.

In the next question, respondents were asked about symptoms that do not accompany dysphagia. The correct answer (neglect, cough, peripheral palsy of the V nerve) was indicated by only 29.4% of respondents in neurological departments and 22.2% in internal departments. It should be emphasized that other symptoms of dysphagia include: coughing, choking, sneezing and nasal discharge of food.

Nurses of neurological departments demonstrated knowledge of the element of direct dysphagia examination, which is observation. Over 70% of the respondents indicated the correct answer. However, in internal departments, observation was chosen by only 36.1% of respondents. A detailed distribution of responses in the surveyed departments is shown in Table 1.

**Table 1.** Element of direct examination of dysphagia

Direct examination	Neurological departments		Internal departments	
	N	%	N	%
Interview	7	20.6	15	41.6
Examination of Babinski reflex	2	5.9	2	5.6
Observation	25	73.5	13	36.1
Assessment of cognitive functions	0	0.0	6	16.7

Source: Own research based on question 5, part II of the author's questionnaire

The knowledge of nursing staff was also assessed with regard to the correct name of the most commonly used screening test for dysphagia — 90 ml water test (De Pippo). The correct answer was indicated by only 32.3% of neurological nurses and 27.3% of internal medicine nurses. Among the surveyed neurological departments, the most frequently chosen answer was the GUSS test (41.2%). This is probably due to the fact that this test is often performed in clinical practice by a neuro-speech therapist.

Most of the nurses from both surveyed departments answered the question about the products that the patient can eat with a low risk of aspiration. The recommended products in this case are: banana, skinless bread, natural yoghurt, moist scrambled eggs.

The surveyed nurses were also asked to identify products that are contraindicated in severe swallowing disorders. The correct answer (chopped vegetables in soup, yoghurt with pieces of fruit, spinach, and salad) was indicated by 91.2% of neurological nurses and 77.8% of internal medicine nurses.

Another issue concerned the method used to reduce or eliminate aspiration in the case of isolated, slight difficulties in fluid intake. Most of the respondents answered correctly that it is fluid condensation (91.3%

from neurological departments vs. 75% from internal medicine departments). The characteristics of the respondents' answers are presented in Table 2.

**Table 2.** The most common method to reduce or eliminate aspiration with some isolated fluid intake difficulties

Ways to reduce aspiration	Neurological departments		Internal departments	
	N	%	N	%
Concentration of liquids	31	91.3	27	75
Complete elimination of fluid from the diet	1	2.9	0	0.0
Serving only mixed, mushy products	1	2.9	7	19.4
Changing the diet has an entera lor parenteral diet and insertion of PEG-a	1	2.9	2	5.6

Source: Own research based on question 9, part II of the author's questionnaire

Respondents were also asked about the consistency that people with post-stroke dysphagia most often choke with. The correct answer, i.e. liquid consistency, was indicated by almost all respondents (88.2%) from neurological departments. However, in internal medicine departments, this answer was chosen by half of the respondents.

Most of the respondents correctly answered the question of what should be excluded from the diet when the patient is prescribed "concentrated fluids+mixed diet". In the case of nurses from neurological departments, the correct answer — an apple — was marked by nearly 80% of people, and in the second group — nearly 60%.

The last question about what is not a contraindication for the swallowing screening test, the majority of neurological nurses (88.3%) correctly indicated that these are not oxygen whiskers, the presence of which allows the test to be performed. The same answer was given by half of the internal medicine departments. It should be emphasized that the contraindications for performing the screening test are: supine position, inability to establish contact with the patient and a foreign body in the mouth.

## Discussion

Dysphagia is considered to be an interdisciplinary problem of various aetiology, more common in people after stroke [17]. Swallowing disorders appear to be an overlooked and unrecognized issue in many departments. Thus, dedicated swallowing screening tests and appropriate therapeutic management are not being implemented.

Swallowing disorders not only cause malnutrition and dehydration, but also increase the risk of developing aspiration pneumonia. Dysphagia leads to an increase in mortality. According to Lewicka and Krzysztanek, dysphagia is observed in 60% of patients after stroke [12,18].

Up to 80% of stroke patients suffer from swallowing disorders. Nevertheless, dysphagia is an issue that is not paid much attention to, especially in departments other than neurology (internal medicine, surgery, geriatrics, etc.) [12].

In this study, the level of knowledge about swallowing disorders was assessed among 70 nurses who worked in neurological or internal medicine departments. Own research has shown that the gender of the respondents does not affect the level of knowledge about dysphagia. The age of the respondents does not correlate with the level of knowledge of the nurses about dysphagia. In turn, the length of service affects the knowledge of nurses in this area. The greater the seniority, the higher the level of knowledge of the respondents in the field of dysphagia. Similarly, the workplace. Neurological nurses were characterized by a higher level of knowledge about dysphagia than nurses from internal medicine departments. On the other hand, the level of knowledge about dysphagia does not depend on the education of the surveyed nurses.

When consuming food by the patient, it is necessary to observe the appropriate body position, properly selected diet consistency, use appropriate cups and spoons, and avoid foods that may aggravate swallowing disorders [15,19]. You should also pay attention to:

- the size of a single portion,
- the right position,
- speed of food supply,
- the number and intensity of external stimuli (the so-called distractors) [12,19].

When eating meals, a sitting position is recommended, but not accepted by all patients. If the patient is unable to sit while eating food, he should assume a semi-sitting position with head control — the support angle should be greater than 30 degrees [15,19]. It is recommended for the patient to bring the head to the sternum. It is also worth remembering that the head should not be tilted back when drinking, as this significantly reduces the risk of aspiration [19]. In order to prevent the reflux of gastric contents to the upper digestive tract the person being fed should remain in a semi-sitting or sitting position for at least half an hour after finishing eating [13].

Maintaining oral hygiene is very important in preventing aspiration pneumonia. Before performing screening tests, oral hygiene should be performed. It is the first stage before testing, aimed at cleaning the oral

cavity of food debris [16]. The mouth should be checked and cleaned before and after each meal.

The correct quality of swallowing is influenced by appropriately selected consistencies of food. Most often, the patient has the greatest difficulties with a liquid consistency — water, juice, tea and problems can be caused by solid consistency — e.g. meat, bread. The so-called double consistency, which is a mixture of solid and liquid food, e.g. soup with noodles. Products with a smooth, pasty, mixed consistency are the best alternative food for people who choke on solid and liquid consistencies [12]. In case of difficulties, it is best if vegetables and fruit are in a cooked form, e.g. puree [20]. Specialists of the American Academy of Nutrition and Dietetics introduced recommendations for people with swallowing disorders — National Dysphagia Diet, concerning four food levels [16].

**Table 3.** Four levels of food consistency — The National Dysphagia Diet [16]

Level	Name of levels of food consistency
Level 1	Smooth products, puddings (jelly). Products that do not need to be tossed, e.g. pudding, yoghurt, mixed fruit, vegetable puree.
Level 2	Moist foods that need to be chewed. This group includes cooked, soft vegetables and fruits, minced, soft meat, and cottage cheese. Watch out for nuts and dry foods that make chewing difficult and crumble!
Level 3	Soft, solid products that require more chewing. They include meat, vegetables and fruit that do not cause chewing difficulties. Watch out for crunchy, sticky and very dry foods such as crackers and nuts!
Level 4	Products covering all foods.

Source: Own study based on [16]

A fluid classification has also been developed to determine what a patient with dysphagia can consume:

- thin — these include liquid, thin ones, e.g. tea, water, coffee,
- nectar-like — liquids in the form of nectar, are thicker than water, so they are easier to swallow, e.g. tomato or nectar juice,
- honey-like — liquid honey. To obtain such a consistency, use thickeners,
- spoon-trick — very dense, which the patient is unable to drink from a cup or through a straw, therefore it should be administered with a spoon [12].

While the patient is choking on fluids, it is very helpful to modify — thicken the fluids. The concentrated fluid moves more slowly, which gives the patient adequate time to react, and also allows him to effectively close the laryngeal entrance to prevent fluid from entering

the lungs, causing aspiration pneumonia [13,21]. Several preparations for thickening liquids are available on the market. These are odourless, tasteless, lactose-free, gluten-free substances, in the form of a powder on gum base (e.g. guar and/or xanthan) or starch [13,17]. The use of this type of thickeners allows to maintain the clarity, taste and smell of meals consumed by the patient [16]. By adding this product to the liquid, you can get three consistencies depending on the amount of powder added, i.e. syrup, cream and pudding [17]. It should be noted that if we do not have a professional thickener, we can use potato flour/starch or banana to change the consistency density (its thickening) [16].

If the patient cannot eat food orally, it is necessary to use a different route of food supply. It is important to remember that the nutrition of choice is enteral nutrition, and in the case of contraindications to enteral nutrition, parenteral nutrition is used [6,22]. The best known and most frequently used method is a nasogastric tube, called a probe. The presence of a tube can cause many complications. These include, among others, inflammation of the nasal cavity and throat, abrasions of the nasal mucosa, the presence of bedsores and erosions in the throats and oesophagus [23]. It should be remembered that each time meals or liquids are administered, the position of the tube must be checked [16]. If the probe is incorrectly positioned, the gastric contents pass into the respiratory system, which may lead to aspiration pneumonia. Foods administered through the tube should be mixed — to a liquid or semi-liquid consistency, and the tube should be rinsed with water after each consumption of meals [16,23]. During the supply, the patient should be in a semi-sitting position (if he tolerates this position).

Gastrostomy (PEG) is the delivery of nutrients to the patient's body by a route other than the oral route [23]. Subcutaneous endoscopic gastronomy is a procedure performed by a surgeon under local anaesthesia, less often with deep sedation. The material from which the drain is made does not cause bedsores and inflammations, there it is worn for a longer period [23]. The World Health Organization (WHO) recommends feeding the patient through a nutritional, gastric or intestinal fistula in the event that the patient has difficult swallowing for more than two weeks. It is a more convenient and safer way of feeding the patient [16].

Methods of supplying food and liquids via the enteral route:

- bolus method — syringes or sometimes pumps are used to administer food. Large amounts of food are served in a short period of time, maintaining the appropriate intervals between subsequent food supplies,
- continuous infusion method — lasts several hours, the food is slowly fed using pumps or by gravity,

— gravity method — the food goes to the stomach with the help of gravity. The speed at which it flows is controlled by the constriction of the flow which is on the drainage of the diet administration set [6].

If the PEG tube is properly used, it can be used for up to two years [19]. In people fed with gastronomy, an industrial diet is recommended and a mixed kitchen diet can be administered [6].

## Conclusions

1. Gender and age of the respondents did not affect the level of knowledge about dysphagia.
2. The length of service influences the nurses' knowledge swallowing disorders. The greater the seniority, the higher the level of knowledge of the respondents in the field of dysphagia.
3. Nursing staff's workplace has an impact on knowledge of swallowing disorders. The neurological nurses were characterized by a higher level of knowledge in this field than nurses from internal medicine departments.
4. The level of knowledge about dysphagia does not depend on the education of the surveyed nurses.

## Implications for Nursing Practice

There are no reports in the literature regarding the assessment of nurses' knowledge of swallowing disorders. This work can be the basis for a broader research on this issue. Subsequent studies could also include other wards where patients with dysphagia are hospitalized. Further research would enable nurses to broaden their knowledge in this area, which would undoubtedly have a significant impact on reducing the risk of complications related to the presence of dysphagia.

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