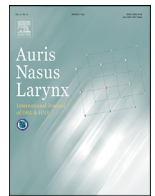




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Original Article

Questionnaire survey on nurses and speech therapists regarding dysphagia rehabilitation in Japan

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ABSTRACT

Objective: Current interventions of dysphagia are not generalizable, and treatments are commonly used in combination. We conducted a questionnaire survey on nurses and speech therapists regarding dysphagia rehabilitation to understand the current situation in Japan.

Methods: The questionnaire was sent to 616 certified nurses in dysphasia nursing and 254 certified speech-language-hearing therapists for dysphagia. Based on “Summaries of training methods in 2014” by JSDR, 24 local indirect exercises, 11 general indirect exercises, and 13 direct exercises were selected. The Likert scale “How do you feel about each method” was used as follows: A; Frequency, B; Ease, C; Adherence, D; Effectiveness (1–5)?”.

Results: Two hundred fifty (40%) nurses and 145 (57%) speech-language-hearing therapists (ST) responded to the questionnaire. The direct exercise was associated with a significantly high score in every question. In indirect exercises, “Cervical range of motion exercise,” “Orofacial myofunctional exercise,” “Lip closure exercise,” “Ice massage of pharynx” and “Huffing” were used relatively frequently. “Balloon dilatation therapy” and “Tube exercise” was associated with a relatively high discrepancy for two questions. Frequency” and the sum of “Ease,” “Adher-

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ence,” and “Effectiveness.” was significantly correlated for local indirect exercises ($r_2 = 0.928$, $P < 0.01$), general indirect exercises ($r_2 = 0.987$, $P < 0.01$), and direct exercises ($r_2 = 0.996$, $P < 0.01$) (Fig. 5).

Conclusion: This study examined the current situation of dysphagia rehabilitation in Japan. Our results aid to increase understanding and selection of rehabilitative treatments for dysphagia patients in Japan.

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1. Introduction

Difficulty in swallowing (dysphagia) frequently occurs in the elderly [1], after stroke, in those with head and neck cancer [2] and in neurological diseases [3]. As a result of dysphagia, an affected person may only be able to consume small volumes of fluid and food, and consequently develop malnutrition and dehydration. In addition to malnutrition and dehydration, individuals with dysphagia are also associated with severe complications such as aspiration pneumonia and increased mortality.

Appropriate management of dysphagia is a significant challenge for the Japanese health care systems. Various treatments for dysphagia have been introduced and studied [4,5]. These treatments can be categorized as follows: dysphagia rehabilitation such as direct exercise, general indirect exercise, local indirect exercise, and surgical. There is currently no single therapeutic intervention leading to consistent recovery of swallowing physiology. Therefore, current interventions are not generalizable, and treatments are commonly used in combination [5]. The Japanese Society of Dysphagia Rehabilitation (JSDR) described “Summaries of training methods in 2014” [6] which contains 25 indirect exercises and 13 direct exercises. The selection of adequate treatment is challenging. In this study, we conducted a questionnaire survey on nurses and speech therapists regarding dysphagia rehabilitation to understand the current situation in Japan and to explore the direction of future therapeutic strategies for dysphagia patients.

2. Methods

2.1. Participants

The questionnaire was sent to 616 certified nurses in dysphasia nursing and 254 certified speech-language-hearing therapists for dysphagia. This study was approved by the Tohoku University Hospital Institutional Review Board (IRB).

2.2. Questionnaire

Based on “Summaries of training methods in 2014” by JSDR [6], 24 local indirect exercises, 11 general indirect exercises, and 13 direct exercises were selected (Table 1). The Likert scale (1, 2, 3, 4, 5) “How do you feel about each method?” was used as follows: A; Frequency (1: Almost never practice, 5: Practice frequently), B; Ease (1: Difficult to practice, 5: Easy to practice), C; Adherence (1: Difficult to be accepted, 5: Easy to be accepted), D; Effectiveness (1: Not effective, 5: Effective).

Table 1

Dysphagia rehabilitation: Indirect exercise (local) (left), Indirect exercise (general) (middle), Direct exercise (right).

Indirect exercise (local)	
1	Cervical range of motion exercise
2	jaw opening exercise
3	orofacial myofunctional exercise
4	Lip closure exercise
5	ice massage of salivary gland
6	Lingual exercise
7	Tube exercise
8	Ice lick exercise
9	Tongue-hold swallow
10	Head Lift exercise
11	Forehead gymnastics
12	balloon dilatation method
13	blowing exercise
14	Pushing/Pulling exercise
15	Thermal-tactile stimulation
16	ice massage of pharynx
17	Gum rubbing
18	supraglottic swallow
19	Anterior region of neck stimulation
20	Electrical stimulation therapy
21	Effortful swallow
22	Mendelsohn maneuver
23	Showa swallow maneuver
24	K-point stimulation
Indirect exercise (general)	
25	Trunk muscle facilitation exercise
26	Bridge training
27	Pelvic training
28	Coastability training
29	Other
30	Thoracic mobility exercise
31	Abdomen weight load method
32	Expiratory Muscle Strength Training
33	respiratory muscles training
34	Lee Silverman Voice Treatment
35	Huffing
36	Other
Direct exercise	
37	think swallow
38	neck rotation
39	alternative swallowing
40	Straw pipette maneuver
41	Diet modification
42	Swallowing whole slice type jelly method
43	modification of a mouthful of food
44	Reclined position
45	chin tuck
46	Lying down on unaffected side
47	Reclined sitting position with the neck flexed
48	Nasal swallowing
49	Multiple swallowing

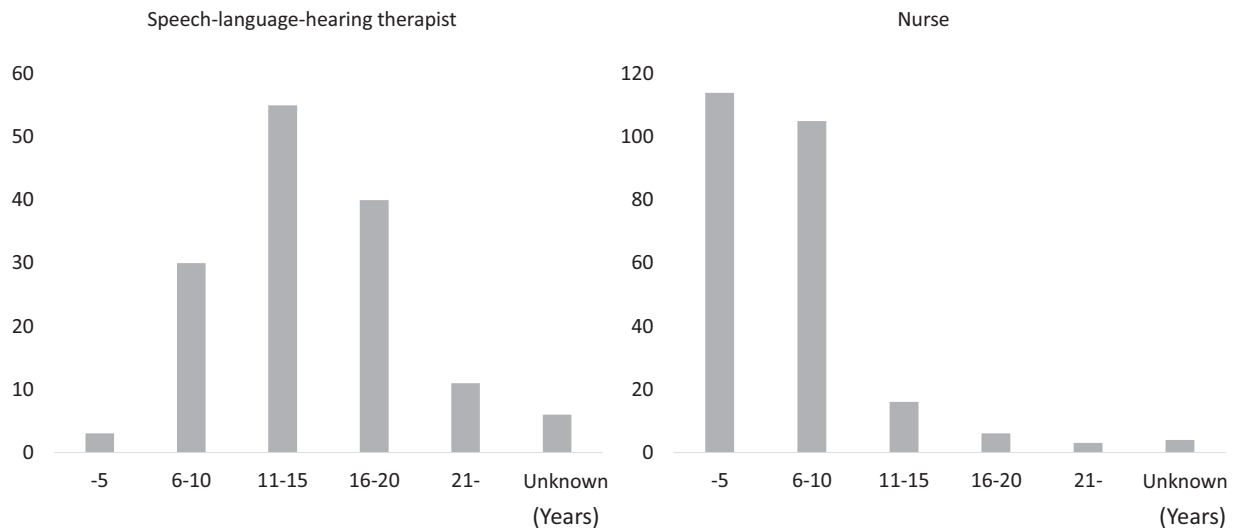


Fig. 1. Years of experience of speech-language-hearing therapists (ST) and nurses.

2.3. Statistical analysis

The Kruskal-Wallis test, Mann-Whitney U test and Pearson's product-moment correlation coefficient test were performed using the statistical software SPSS version 20 (IBM, Chicago, IL, USA). Differences with a corrected p-value of less than 0.05 were considered significant. Data are presented as mean \pm standard deviation.

3. Result

Two hundred fifty (40%) nurses and 145 (57%) speech-language-hearing therapists (ST) responded to the questionnaire. The experience of each specialist in years is shown in Fig. 1. Compiled results are shown in Fig. 2. The direct exercise was significantly higher score than local and general indirect exercise in "Frequency," "Ease," and "Effectiveness." (Fig. 3). In indirect exercises, "Cervical range of motion exercise #1," "Orofacial myofunctional exercise #3," "Lip closure exercise #4," "Ice massage of pharynx #16" and "Huffing #35" were used relatively frequently. The difference between "Frequency" and "Effectiveness" is illustrated in Fig. 4. "Balloon dilatation therapy #12" and "Tube exercise #7" was associated with a relatively high discrepancy for two questions. "Frequency" and the sum of "Ease," "Adherence," and "Effectiveness." was significantly correlated for local indirect exercises ($r^2 = 0.928$, $P < 0.01$), general indirect exercises ($r^2 = 0.987$, $P < 0.01$), and direct exercises ($r^2 = 0.996$, $P < 0.01$) (Fig. 5).

4. Discussion

Our research examined the current situation of dysphagia rehabilitation in Japan by questionnaire. This study may be valid in reflecting the current situation in Japan as close to half of the surveyed certified nurses and speech therapists responded to our questionnaire.

The direct exercise was associated with a significantly high score in every question compared to the other exercises. These results suggested that direct exercises could be at the center of dysphagia rehabilitation. Many direct exercises have been reported and thirteen direct exercises were selected by "Summaries of training methods in 2014" [6]. The proper rehabilitative treatment of dysphagia should be selected after through critical evaluation and analysis coupled with an understanding of the available research evidence, clinical experience, and consideration of the patient's objectives and goals [5].

"Cervical range of motion exercise," "Orofacial myofunctional exercise," "Lip closure exercise." "Ice massage of pharynx" and "Huffing" were used relatively frequently in our study cohort. Cervical range of motion exercises such as neck flexion, neck side bends, neck extension, and neck flexion with side rotation are performed to improve cervical range of motion [7,8]. Patients with severe dysphagia tend to have a severely restricted range of motion in the cervical spine and are unable to lower the chin or rotate the head adequately. Consequently, improving the cervical range of motion in dysphasia patients is considered essential. Orofacial myofunctional exercise (oral motor exercises) are useful in the rehabilitation of swallowing function in the oral phase as it improves orofacial (lip, tongue, cheek) muscle strength [9,10], swallowing pressures, airway protection, and lingual volume [11]. Lip closure exercise aims to obtain lip closure function by an improvement of tension and motor activity of muscles around the lips, particularly the orbicularis oris muscle. This exercise is divided into passive training and self-training methods. Ice massage with an ice stick applied to the throat, the base of the anterior faucial arches, the base of the tongue, and the posterior pharyngeal wall is performed as a prefeeding technique to induce dry swallowing, to stimulate swallowing apraxia for initiating the swallowing action, and in daily swallowing training [12]. In Japan, this procedure is widely used as a swallowing training technique and a prefeeding technique, moreover, to promote swallowing in individuals who tend to stop swallowing during meals.

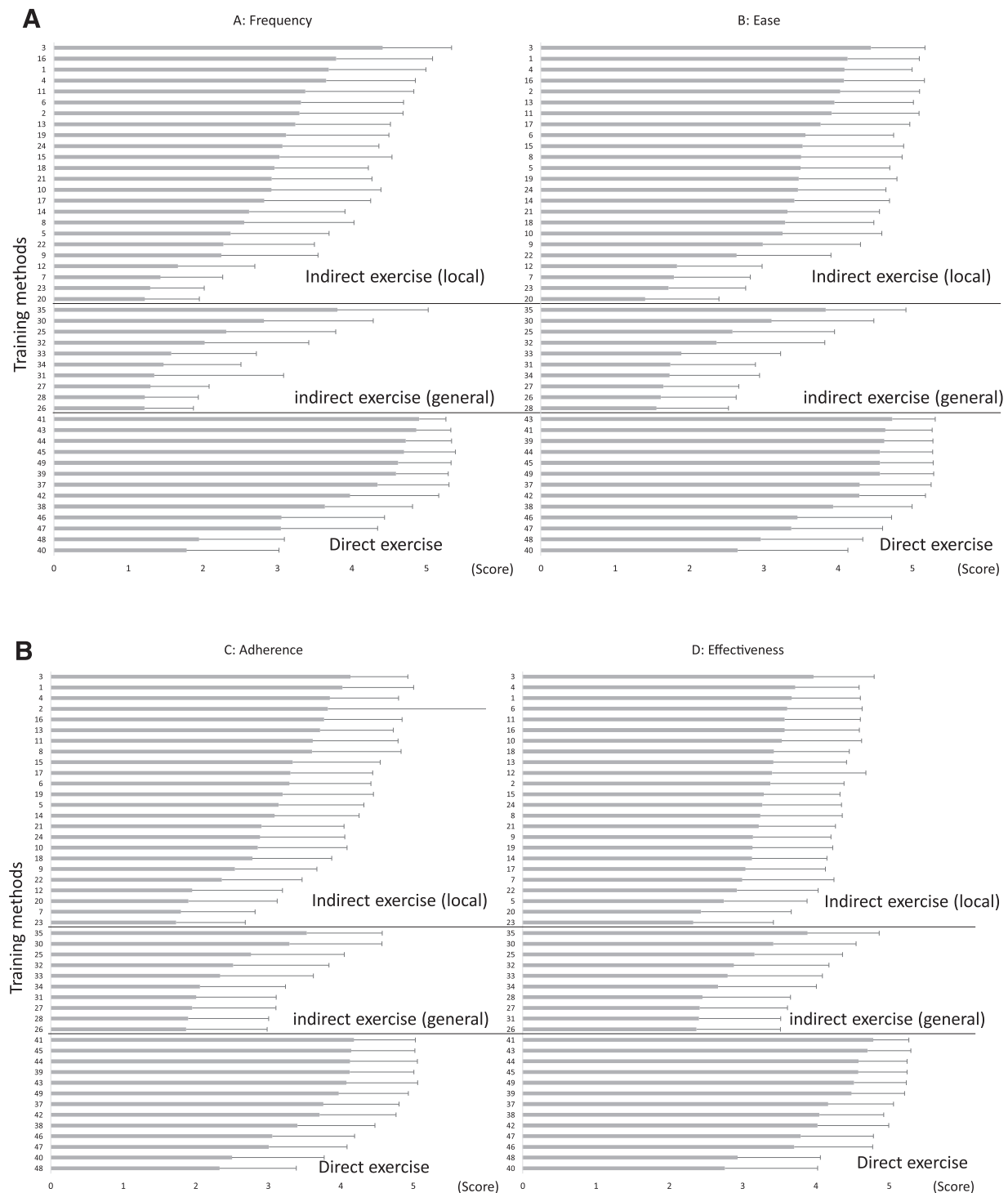


Fig. 2. Compiled questionnaire results. A; Frequency (1: Almost never practice, 5: Practice frequently), B; Ease (1: Difficult to practice, 5: Easy to practice), C; Adherence (1: Difficult to be accepted, 5: Easy to be accepted), D; Effectiveness (1: Not effective, 5: Effective).

Huffing, defined as exhaling quickly and with strength while the glottis is open, is a forced expiratory maneuver and together with coughing, are useful factors in evaluating the risk of aspiration in dysphagia patients [13]. These maneuvers usually involve pressure application to the chest and is usually used to move sputum.

This study evaluated the correlation between “Frequency” and the sum of “Ease,” “Adherence,” and “Effectiveness” to

understand the discrepancy between the actual frequency of use and the evaluation of each method by nurses in dysphagia nursing and speech-language-hearing therapists for dysphagia. There was a significant correlation found between “Frequency” and the sum of “Ease,” “Adherence,” and “Effectiveness” in our study. However, “Balloon dilatation therapy” and “Tube exercise” showed relatively high discrepancy for two questions. These results suggest that many nurses and speech-

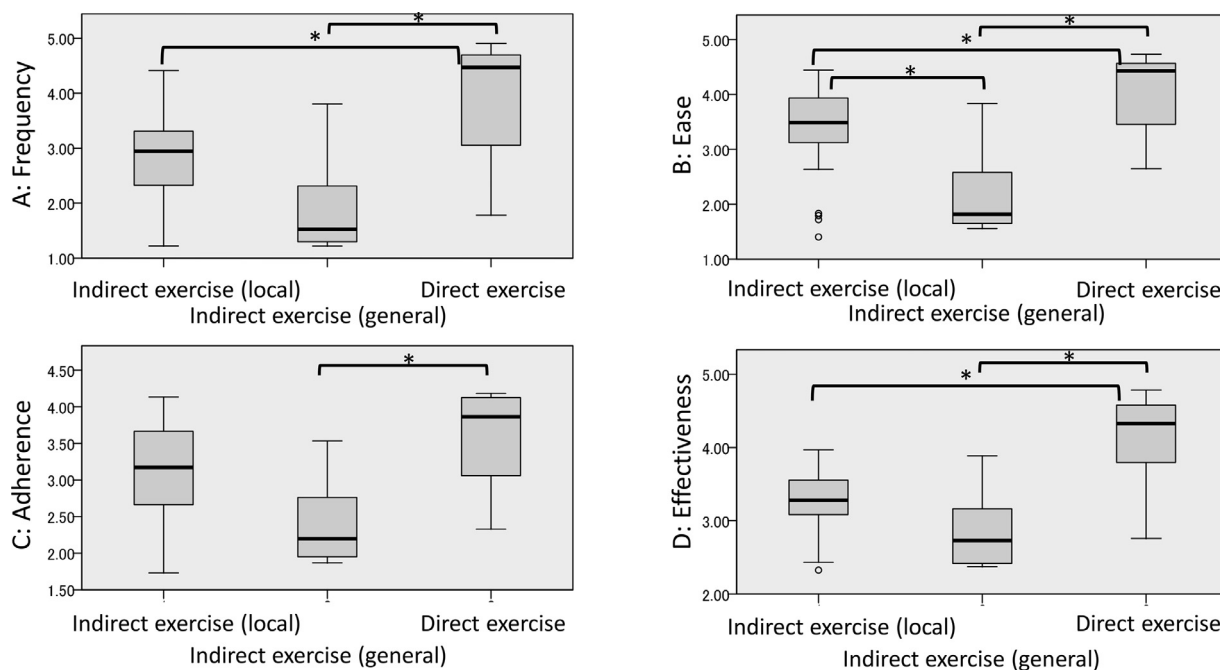


Fig. 3. The difference between “Frequency (A)” and “Effectiveness (D).” Fig. 4: The correlation between “Frequency (A),” and the sum of “Ease (B),” “Adherence (C),” and “Effectiveness (D).”.

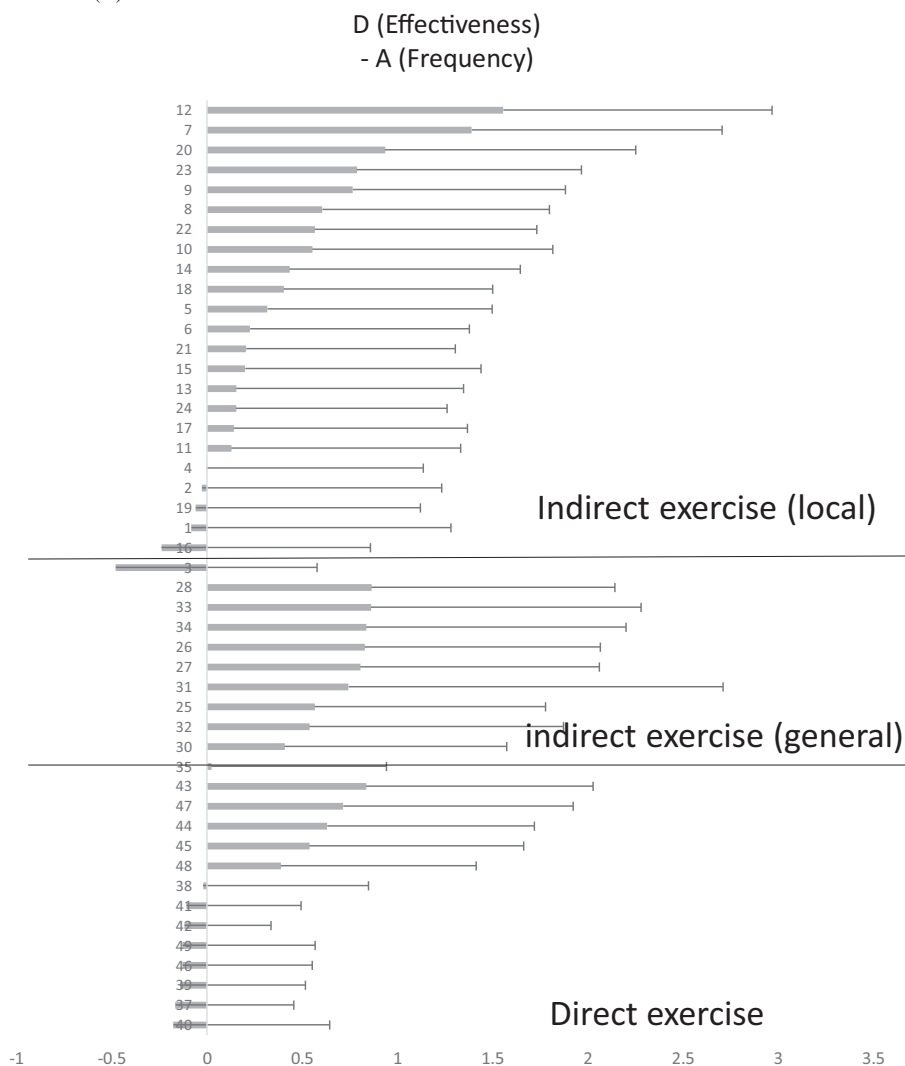


Fig. 4. The difference between “Frequency (A)” and “Effectiveness (D).”.

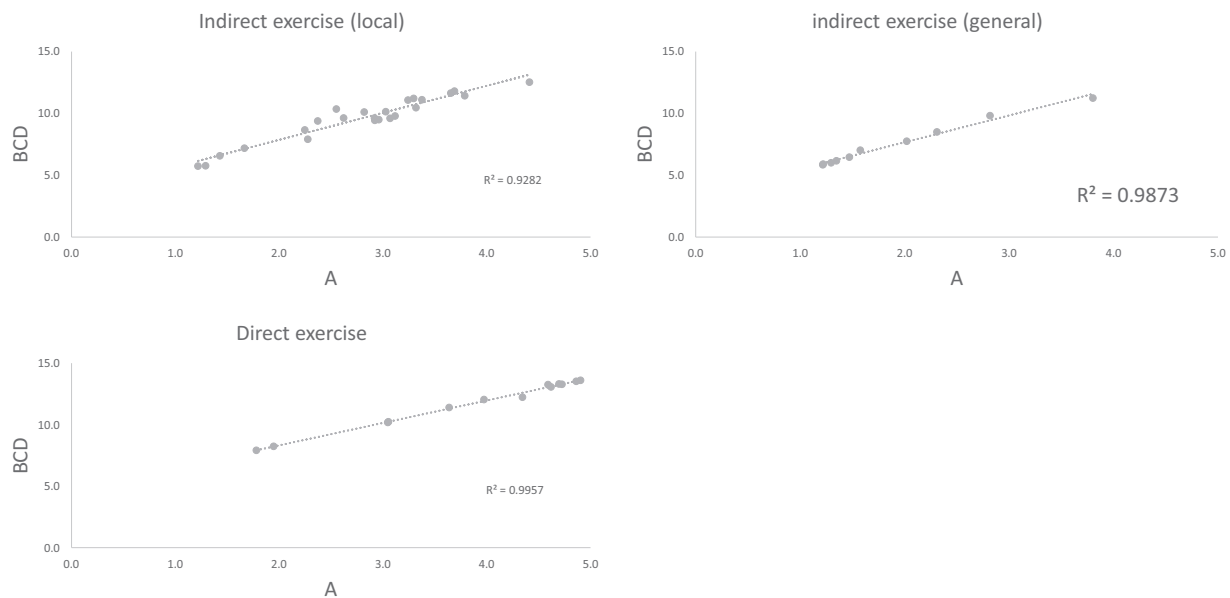


Fig. 5. The correlation between “Frequency (A),” and the sum of “Ease (B),” “Adherence (C),” and “Effectiveness (D).”.

language-hearing therapists recognize that these methods are effective but are hard to perform because it involves invasive procedures. Balloon dilatation is useful for dysphagia patients experiencing failure of upper esophageal sphincter relaxation [14]. A transoral or transnasal catheter is first inserted beyond the entrance of the esophagus. A balloon is then inflated, expanding the upper esophageal sphincter, and then withdrawn. In another method, a catheter is inserted in the entrance of the esophagus to expand the region by intermittent inflation of a balloon.

Tube exercise improves the speed and displacement of laryngeal elevation motion and involves repeated swallowing of a tube or catheter. This method also improves the lingual feeding movement and cooperativeness at the pharyngeal stage of deglutition.

5. Limitation

Our study was based self-reporting, which may not accurately reflect efficacy and may not be completely valid. In addition, few strong evidence dysphagia rehabilitations have ever existed. Further studies are needed to evaluate efficacy and validity for each therapy. In addition, this research did not consider the patient’s background. However, our results provide a reference point for future development of dysphagia rehabilitation.

Conclusion

This study examined the current situation of dysphagia rehabilitation in Japan. Direct exercises could be at the center of dysphagia rehabilitation. Our results aid to increase understanding and selection of rehabilitative treatments for dysphagia patients in Japan. More reports of dysphagia rehabilitation with high evidence are awaited in the future.

Compliance with ethical standards

The authors declare no financial relationships or conflict of interest.

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Ethical approval

Informed consent

This study was approved by the Tohoku University Hospital Institutional Review Board (IRB protocol number: 2018-2-213).

Declaration of Competing Interest

The authors declare no financial relationships or conflict of interest.

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