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Implementation of the International Dysphagia Diet Standardisation Initiative in neurological hospitals in the German-speaking D-A-CH region: structural and organizational associations from a cross-sectional survey

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Abstract

Background

The International Dysphagia Diet Standardisation Initiative (IDDSI) provides a common terminology and testing framework for texture-modified foods and liquids in dysphagia care. Despite increasing global adoption of IDDSI, evidence remains limited which structural and organisational conditions are associated with successful implementation in routine clinical practice.

Methods

This cross-sectional first-wave hospital survey examined IDDSI knowledge, planning and implementation status for Germany, Austria and German-speaking Switzerland (D-A-CH), using the Monitor-Aware-Prepare-Adopt implementation model to classify implementation as a staged organisational process. One knowledgeable professional per site was invited to complete an electronic questionnaire. Institutional characteristics and IDDSI-related variables were analysed. Differences were examined using non-parametric and categorical tests. Ordinal logistic regression was used to explore structural and organisational characteristics associated with implementation status.

Results

Of 332 invited institutions, 132 were included in the analysis. The overall response rate was 39.8%, with country-specific rates of 25.9% in Germany, 55.1% in Austria and 51.9% in German-speaking Switzerland. Most respondents were speech and language therapists or related professionals (87.1%). Awareness was high, with 97.7% reporting familiarity with IDDSI, and 76.5% indicating active institutional engagement with implementation. Implementation status differed significantly between countries ($p = .006$), with lower levels in Germany than in Austria and German-speaking Switzerland. The final regression model was significant ($p = .044$). No individual predictor reached significance.

Discussion

IDDSI awareness was high among institutions, but implementation remained heterogeneous. Implementation is embedded in broader organisational conditions and accessible across settings rather than explained by a single institutional factor. Longitudinal follow-up is planned to examine implementation trajectories and institutional predictors of change.

Summary

- This study provides a multi-country institutional map of IDDSI knowledge, planning and implementation status according to the MAPA implementation model in neurological acute care and rehabilitation hospitals for adults in the German-speaking D-A-CH region.

- IDDSI awareness was high among responding institutions, but implementation status remained heterogeneous, indicating a gap between professional visibility and full institutional adoption.
- Implementation status differed between countries and was analysed in relation to structural and organisational hospital characteristics, including food-service organisation, implementation teams and harmonised level of care emphasizing cross-sectoral adaptability.

The findings may help clinicians and organisational stakeholders anticipate implementation obstacles and plan targeted IDDSI implementation strategies across clinical, interprofessional and food-service processes.

Introduction

Oropharyngeal dysphagia is a multi-aetiology disorder of swallowing safety and efficiency, referring to impaired processing and transport of food, fluids, medication, or saliva from the oral cavity towards the stomach. It commonly occurs in neurological and neurogeriatric populations, including acute cerebrovascular disease and progressive neurodegenerative disorders (Takizawa et al., 2016; Dziewas et al., 2021; Mira et al., 2022; Labeit et al., 2025). Its clinical relevance extends beyond impaired bolus transport, as dysphagia is associated with reduced quality of life, choking, medication-administration problems, aspiration pneumonia, malnutrition, dehydration, increased health-care costs and mortality (Dziewas et al., 2021; Smith et al., 2023; Labeit et al., 2025; Trapl-Grundschober et al., 2025; Werner et al., 2026).

Maintaining oral intake is a central goal in dysphagia management as eating and drinking not only serves nutritional and hydration needs, but also functional, sensory, social and quality-of-life purposes. From a function-oriented rehabilitation perspective, dysphagia management can be broadly organised into restorative, compensatory and adaptive approaches (Speyer et al., 2022): Among adaptive strategies, texture-modified foods (TMFs) have a long clinical tradition and remain widely used to support oral intake by modifying bolus flow, viscosity, hardness, cohesiveness, stickiness, softness or particle size according to the individual pathophysiology of swallowing impairment (Coster & Schwarz, 1987; Robertson & Pattilo, 1993). However, the historical absence of consistent terminology and definitions for texture-modified foods and liquids across professions, institutions and care sectors has limited communication between dietetics, speech and language therapy, nursing, medicine and food services, providing the rationale for a common framework such as the International Dysphagia Diet Standardisation Initiative (IDDSI) (Cichero et al., 2013).

IDDSI was developed to address the need for internationally consistent terminology, classification and practical testing of texture-modified foods and thickened liquids. Launched in 2013, IDDSI provides a global framework for describing food textures and drink thickness levels using accessible testing methods that can be applied across clinical, food-service and community settings (Cichero et al., 2017). Its classification logic reflects clinically relevant oral-motor and swallowing-related properties, including flow rate, tongue-pressure demands, bolus cohesiveness or adhesiveness, and particle size, thereby supporting communication between medical and non-medical stakeholders involved in dysphagia care. Importantly, IDDSI should not be interpreted as evidence that texture-modified diets are clinically effective for all

patients; rather, its primary contribution is to provide a shared language and testable terminology for describing and communicating diet textures and liquid consistencies.

IDDSI implementation has increasingly moved from framework development towards institutional adoption and professional endorsement since the first published pilot in 2017 (Lam et al., 2017). This transition can be understood as a staged organisational change process, as reflected in the MAPA model (Monitor-Aware-Prepare-Adopt), which frames implementation as progressing through successive phases rather than as a binary implemented/not implemented outcome (IDDSI, 2024; Sollereder et al., 2025). From a broader implementation-science perspective, these phases can be understood as reflecting progression from awareness and readiness towards adoption, routinisation and fidelity within a specific organisational context. Implementation literature emphasises that successful translation into practice is shaped by inner-setting characteristics, leadership engagement, available resources, implementation climate, professional roles, stakeholder participation and local adaptation. For IDDSI, these themes are particularly relevant because implementation requires coordinated change across clinical, dietetic, nursing, food-service and administrative processes rather than adoption by a single professional group. The model is useful for describing where institutions are within the implementation pathway and for identifying remaining steps towards routine practice. Recent studies from aged-care, rehabilitation and acute-care settings indicate that structured model-oriented IDDSI implementation can improve use of standardised terminology, multiprofessional communication, food-service procedures, staff knowledge, and the accuracy or compliance of texture-modified diet provision, while also highlighting recurrent implementation challenges related to training, auditing, workflow integration and food-service infrastructure (Brewsaugh et al., 2022; Son et al., 2022; Wu et al., 2022a, Wu et al., 2022b;. Pogorelčnik & Vogrinčič, 2024; Feiner et al., 2025; Cunningham et al., 2026). Recent European initiatives such as the IDDSI Declaration 2025 have further strengthened this role by calling for IDDSI to be promoted as standard terminology for modified food textures and thickened drinks across healthcare, community care, food services, industry, education and research (IDDSI, 2025). Nevertheless, although IDDSI is internationally available and increasingly endorsed, its translation into routine hospital practice possibly depends on local organisational structures, professional responsibilities and food-service systems. The extent to which these factors shape IDDSI implementation in neurological acute care and rehabilitation hospitals remains insufficiently understood. Therefore, this cross-sectional hospital survey aimed to (1) examine structural and organisational characteristics associated with the knowledge, planning and implementation status of the International Dysphagia Diet Standardisation Initiative according to the MAPA-model in neurological acute care and rehabilitation hospitals for adults in the German-speaking D-A-CH region. A secondary aim (2) was to compare implementation-related indicators between Germany (D), Austria (A) and German-speaking Switzerland (CH-ger).

Methods

Study Design and Setting

The overall project includes two planned data collection time periods with the first conducted from August - September 2024 (for CH-ger) and from April to June 2025 (for D & A) and a second data collection planned

for 2027. The present analysis includes only the first time period and is therefore reported as a pooled cross-sectional hospital survey. The target setting comprised neurological acute care hospitals and neurological rehabilitation facilities providing care for adults (> age of 18) with neurological conditions. The number of institutions was identified from publicly available sources, including hospital registries, stroke-unit registers, rehabilitation facility listings and institutional websites. The initial sampling target was based on an estimated D-A-CH source population of 2250 potentially relevant institutions. Country-specific target sample sizes were estimated using a standard finite-population sample-size calculation for proportions, assuming a 95% confidence level (CL), 7% margin of error (MoE) and maximum variability. The resulting country-specific targets were summed to n = 357 institutions. After identification according to federal state and hospital size and after inclusion of additional eligible institutions that had expressed interest following dissemination through professional associations, 332 institutions were invited, corresponding to 93.0% of the calculated target sample (see Fig. 1).

One knowledgeable professional per institutional site was invited to complete the questionnaire on behalf of the institution. Eligible respondents were professionals with institutional knowledge of IDDSI-related activities. Contacts were identified through publicly available institutional information and, where direct contact was not available, through data-protection-compliant dissemination via professional organisations and dysphagia networks. Participation required local institutional permission where applicable and informed consent at the start of the electronic survey.

Data Collection and Variables

Data were collected using a fully electronic questionnaire implemented in SoSci Survey (SoSciSurvey GmbH, version 3.5.02; Leiner, 2024). The questionnaire was developed for this project based on a previous *(redacted for blind peer review)* survey from 2019 and was pretested among the authors and experienced speech and language therapists known to the author group before field use to assess comprehensiveness, intelligibility and technical functionality (*redacted for blind peer review)*. It included nominal and ordinal closed questions with single- and multiple-choice response formats, filter questions and selected free-text fields. Survey items captured institutional characteristics, including country, federal state or region, legal form, ownership, level of care and kitchen organisation. IDDSI-related variables included knowledge of IDDSI, planning status, implementation status, perceived implementation challenges and required support measures in relation to the MAPA-model phases. The primary analytical outcome was ordinal IDDSI implementation status phase (aware-prepare-adopt-implemented). Main explanatory variables were structural and organisational institutional characteristics, including level of care, kitchen organisation and the presence of implementation structures.

Statistical Analysis

Responses were included in the final dataset if respondents had at least completed the screening item indicating sufficient knowledge of IDDSI-related processes at the corresponding institutional site. Descriptive statistics were used to summarise institutional characteristics and IDDSI knowledge, planning and implementation status. Nominal variables are reported as absolute and relative frequencies. Ordinal

variables are described using frequency distributions, medians and interquartile ranges where appropriate. Chi-square tests of independence were conducted to examine associations between country and structural hospital characteristics, including federal state, level of care, legal ownership structure, and food-service organisation. Cramér's V was reported as an effect size. Where expected cell frequencies were sparse, Monte Carlo estimation and Fisher-Freeman-Halton exact testing were used. For inferential analyses, non-parametric tests were used because survey variables were predominantly ordinal or nominal. Kruskal-Wallis tests were applied for overall group comparisons of ordinal implementation variables across countries, followed by pairwise Mann-Whitney U tests with Holm correction for multiple testing where appropriate. Effect sizes were reported using ε^2 for Kruskal-Wallis tests and r for Mann-Whitney U tests. Ordinal logistic regression was used to examine structural and organisational characteristics associated with implementation status. Candidate predictors were first assessed based on literature and author consensus. Variables meeting the predefined screening criterion of $p<.20$ were considered for the multivariable model. To improve model stability, interpretability, and reduce sparse-cell effects, low-frequency categories were collapsed, and the model was subsequently refined by removing predictors with limited contribution to overall model performance. Model fit was evaluated using the likelihood-ratio chi-square test and pseudo-R^2 estimates. Regression results are reported with coefficients, standard errors, p values and, where appropriate, odds ratios with 95% confidence intervals.

Results

Institutional Sample and Country-Specific Structural Characteristics

After data cleaning, 132 of 180 submitted responses were included in the final analysis. Based on 332 invited institutions, this yielded an overall institutional response rate of 39.8% for included surveys. Exclusion reasons comprised mainly empty datasets (presumably test entries), insufficiently completed questionnaires and duplicate submissions from the same institution. Where duplicate responses were identified, institutions were contacted for clarification when feasible. If clarification was not possible, the most complete response was included.

The analytical sample comprised 43 institutions from Germany (representing 32.6% of total included samples), 49 from Austria (37.1%) and 40 from German-speaking Switzerland (30.3%). Country-specific response rates were 25.9% for Germany, 55.1% for Austria and 51.9% for German-speaking Switzerland. Table 1 summarizes structural and organisational characteristics by country, with percentages reported within each national sample. Most respondents were speech and language therapists or related professionals (*n* = 115, 87.1%). A further 10 respondents were dietitians or related professionals (7.6%). The remaining respondents belonged to other therapeutic or medical professions, medicine, administration or other professional groups (*n* = 7, 5.3%).

Table 1

Structural and Organisational Characteristics of Responding Institutions by Country

Characteristics[1]	**Germany** ***n*** **= 43**		**Austria** ***n*** **= 49**		**Switzerland (ger)** ***n*** **= 39 /** ***n*** **= 40**[3]		**χ²**	***df***	***n***	***p***	**Cramér's V**
	n	**%**	***n***	**%**	***n***	**%**					
Legal Form[2]							22.9	10	132	.003	.30
Stock Corporation or Limited Liability Company	17	39.5	22	44.9	14	35.0					
Association or Foundation	3	7.0	0	0	10	25.0					
Sole Proprietorship or Partnership	1	2.3	1	2.0	1	2.5					
Public Institution	20	46.5	19	38.8	9	22.5					
No Information Available	2	4.7	7	14.3	5	12.5					
Harmonised Level of Care[2]							35.9	6	131	< .001	.37
Basic and Standard Care Hospitals	5	11.6	8	16.3	10	25.6					
Specialized Care Hospitals	9	20.9	20	40.8	13	33.3					
Maximum Care	26	60.5	11	22.4	2	5.1					

Note. [1]Data are presented as n (%). Percentages are country-specific column percentages; [2]Institutional legal and provider status and harmonised level of care were derived from publicly available institutional information and recoded into D-A-CH categories. German source categories were translated as follows: legal form = Rechtsform/Trägerstatus, Stock Corporation or Limited Liability Company = AG bzw. GmbH, Association or Foundation = Verein bzw. Stiftung, Sole Proprietorship or Partnership = Einzelfirma bzw. Gesellschaft, Public Institution = öffentliche Einrichtung/öffentlicher Träger; Harmonised level of care = Angeglichene Versorgungsstufe, Basic and Standard Care = Grund- bzw. Regelversorgung, Specialised Care Hospital = Schwerpunktversorgung, Maximum Care Hospitals = Maximalversorgung; [3]For this distribution, n = 39 and n = 40 were used due to incomplete responses to the survey item on level of care.

Characteristics[1]	Germany *n* = 43		Austria *n* = 49		Switzerland (ger) *n* = 39 / *n* = 40[3]		χ^2	*df*	*n*	*p*	Cramér's V
	n	%	*n*	%	*n*	%					
Hospitals											
Rehabilitation Facilities	3	7.0	10	20.4	14	35.9					
Food-Service Organisation							37.2	6	132	< .001	.38
Fully internal	11	25.6	23	46.9	27	67.5					
Partly internal	10	23.3	20	40.8	10	25.0					
External	17	39.6	3	6.1	0	0					
No Information	5	11.6	3	6.1	3	7.5					

Note. [1]Data are presented as n (%). Percentages are country-specific column percentages; [2]Institutional legal and provider status and harmonised level of care were derived from publicly available institutional information and recoded into D-A-CH categories. German source categories were translated as follows: legal form = Rechtsform/Trägerstatus, Stock Corporation or Limited Liability Company = AG bzw. GmbH, Association or Foundation = Verein bzw. Stiftung, Sole Proprietorship or Partnership = Einzelfirma bzw. Gesellschaft, Public Institution = öffentliche Einrichtung/öffentlicher Träger; Harmonised level of care = Angeglichene Versorgungsstufe, Basic and Standard Care = Grund- bzw. Regelversorgung, Specialised Care Hospital = Schwerpunktversorgung, Maximum Care Hospitals = Maximalversorgung; [3]For this distribution, n = 39 and n = 40 were used due to incomplete responses to the survey item on level of care.

Institutional legal form differed significantly across countries (Fisher-Freeman-Halton exact test with Monte Carlo estimation: p = .003; Pearson $\chi^2(10, N = 132) = 22.98$, Cramér's V = .30). Public institutions represented the largest subgroup in Germany (46.5%) and Austria (38.8%), whereas stock corporations or limited liability companies were similarly frequent in Germany (39.5%), Austria (44.9%), and German-speaking Switzerland (35.0%). Association- or foundation-based institutions were more frequent in German-speaking Switzerland (25.0%) than in Germany (7.0%) and were not represented in the Austrian sample. Because expected cell counts were sparse, exact/Monte Carlo results were used for inference. Harmonised level of care varied significantly by country ($\chi^2(6, N = 131) = 35.95$, p < .001, Cramér's V = .37). Maximum-care hospitals predominated in Germany (60.5%), specialised care hospitals were most frequent in Austria (40.8%), and rehabilitation facilities represented the largest subgroup in German-speaking Switzerland (35.9%). Internal food-service organisation differed significantly between countries (Fisher-Freeman-Halton exact test with Monte Carlo estimation: p<.001; Pearson $\chi^2(6, N = 132) = 37.20$, Cramér's V = .38). Fully internal food-service was most common in German-speaking Switzerland (67.5%) and Austria (46.9%), whereas Germany had the highest proportion of institutions without internal food-service (39.5%). Overall, significant country differences were observed for legal ownership structure, harmonised level of care, and internal food-service organization (see Table 1).

Knowledge, Planning, and Implementation Status across Countries

Cumulatively, 97.7% (*n* = 129) of respondents reported being familiar with IDDSI, and 76.5% (*n* = 101) indicated that their institution was actively engaged in implementation activities (see Fig. 2).

According to the IDDSI MAPA implementation guides, the most frequently reported implementation phase was “adoption” with 23.3% (*n* = 30). 1.5% (*n* = 2) stopped the implementation. Among institutions that did not plan IDDSI implementation (*n* = 25), the most frequently reported reason, among multiple possible responses, was lack of resources (*n* = 16, 64.0%), followed by absence of a leadership mandate (*n* = 9, 36.0%). Lack of arguments for IDDSI and absence of an interdisciplinary team were each reported by six institutions (24.0%), while lack of professional knowledge was reported by five institutions (20.0%). Furthermore, among those institutions that did not plan IDDSI implementation or had stopped implementation (*n* = 27), the most frequently reported support need was additional resources, including financial, personnel or material resources (*n* = 21, 77.8%). Training courses or workshops for effective and efficient implementation were reported by 15 institutions (55.6%), and support through IDDSI-oriented market products was reported by 12 institutions (44.4%). Publications highlighting positive effects of implementation were selected by nine institutions (33.3%), while further forms of support were reported by three institutions (11.1%).
Implementation status differed significantly between countries (Kruskal-Wallis $H(2) = 10.33$, $p = .006$, $\varepsilon^2 = .065$), indicating systematic cross-country variation. Pairwise Mann-Whitney U tests with Holm correction showed higher implementation status in Austria compared with Germany ($U = 717.0$, $Z = -2.40$, $p=.017$, Holm-adjusted $p = .034$, $r = .25$) and German-speaking Switzerland compared with Germany ($U = 492.5$, $Z = -3.02$, $p = .003$, Holm-adjusted $p = .009$, $r = .34$). No significant difference was observed between Austria and Switzerland ($U = 837.0$, $Z = -1.02$, $p = .309$, Holm-adjusted $p = .309$, $r = .11$). Overall, Germany showed the lowest implementation status, while Austria and Switzerland demonstrated higher implementation levels (see Fig. 3).

Organisational and Structural Correlates of IDDSI Implementation

To explore implementation-related indicators across institutions, ordinal logistic regression models were fitted with implementation status as the ordinal outcome. Implementation team ($\chi^2(3) = 12.53$, $p = .006$, Nagelkerke $R^2 = .13$), implementation plan ($\chi^2(2) = 3.92$, $p = .141$, Nagelkerke $R^2 = .04$), internal kitchen organisation ($\chi^2(1) = 3.70$, $p = .054$, Nagelkerke $R^2 = .04$), and care level ($\chi^2(4) = 6.76$, $p = .149$, Nagelkerke $R^2 = .05$) met this criterion or were retained due to theoretical relevance and expert consensus regarding organisational implementation processes. In the final multivariable ordinal logistic regression model, 71 complete cases were included. The model was statistically significant, $\chi^2(6) = 12.93$, $p = .044$, with acceptable model fit (deviance $p = .508$) and modest explanatory value (Nagelkerke $R^2 = .18$). No individual predictor reached conventional statistical significance in the adjusted model. However, the direction of effects was consistent with the implementation hypothesis: internal kitchen organization showed a positive association with higher implementation status ($B = 0.99$, $p = .208$), whereas absence of an implementation

team showed a trend towards lower implementation status (B = -1.27, p = .084). For comparisons among care institutions, rehabilitation institutions also showed a trend towards lower implementation status (B = -1.02, p = .096), with similar but weaker negative estimates for maximum care and basic/regular care institutions (see Table 2).

Table 2
Final Multivariable Ordinal Logistic Regression Model Predicting IDDSI Implementation Status

Predictor	***B***	***OR***	***95% CI***	***p***
Internal Kitchen	0.99	2.70	0.58–12.54	.208
No Implementation Team	-1.27	0.29	0.07–1.18	.084
Rehabilitation vs Specialised Care Hospitals	-1.02	0.36	0.11–1.20	.096
Maximum Care vs Specialised care Hospitals	-0.85	0.43	0.13–1.41	.165
Regular Care vs Specialised Care Hospitals	-0.86	0.42	0.12–1.49	.180

Discussion

To the authors' best knowledge, this is the first multi-country hospital-level survey to systematically examine IDDSI knowledge, planning and implementation status in neurological acute care and rehabilitation hospitals according to the MAPA-model. The aim of this pooled cross-sectional first-wave analysis was to examine structural and organisational characteristics associated with IDDSI knowledge, planning and implementation status, and to compare implementation-related indicators between Germany, Austria and German-speaking Switzerland. By combining descriptive country-level comparisons with ordinal regression modelling, the survey provides a first institutional baseline for understanding how IDDSI has been translated into routine dysphagia-related care across different hospital and food-service contexts.

Principal Findings

While almost all respondents reported being familiar with IDDSI and approximately three quarters indicated that their institution was actively engaged in implementation activities, implementation status remained heterogeneous, with all MAPA phases represented and "adopt" as the most frequently reported implementation phase. Implementation status differed significantly between countries, with lower implementation levels in Germany than in Austria and German-speaking Switzerland. Notably, the countries also differed substantially in structural and organisational characteristics. These findings suggest that country-level differences in implementation status should not be interpreted as purely national differences,

but rather as reflecting different institutional configurations, service structures and implementation environments.

Implications for implementation practice follow from this interpretation. IDDSI implementation strategies should not be limited to dissemination of the framework or professional education alone. Instead, institutions should consider structured, context-sensitive implementation planning that includes local stakeholder engagement, co-design of food-service and clinical workflows, defined leadership responsibility, interdisciplinary implementation teams, resource planning, training cycles and audit or feedback procedures. The MAPA model may provide a practical staging tool for locating institutions within the implementation pathway, while broader implementation frameworks such as the Consolidated Framework for Implementation Research (CFIR) or the Theoretical Domains Framework or implementation outcome taxonomies (TDF) could inform future survey waves and intervention design by specifying which organisational determinants should be assessed and targeted (Damschoder et al., 2022; Proctor et al., 2011; Cane et al., 2012).

The observed gap between awareness and implementation is consistent with previous implementation studies showing that staff knowledge, terminology use and perceived feasibility can improve through structured implementation, but that sustained adoption depends on more than information provision alone. Site-based implementation projects have reported improvements in staff awareness, standardised terminology, multiprofessional communication and diet-texture accuracy, while also describing persistent barriers related to training, auditing, staff turnover, leadership, workflow integration, food-service procedures and documentation (Harvey et al., 2022; Hopper et al., 2022; Wu et al., 2022a; Wu et al., 2022b; Son et al.,2022; Cunningham et al., 2026). In this context, the very high awareness observed in the present survey can be mapped to speech and language therapists or related professionals with institutional knowledge of dysphagia care. The results therefore most likely reflect expert-reported institutional awareness rather than staff-wide knowledge across all professional groups involved.

The descriptive data on institutions not planning implementation or having stopped implementation further support the interpretation that barriers extend beyond awareness. Among institutions not planning implementation, the most frequently reported reason was lack of resources, followed by absence of a leadership mandate, lack of arguments for IDDSI, absence of an interdisciplinary team and lack of professional knowledge. Similarly, institutions not planning implementation or having stopped implementation most frequently reported a need for additional financial, personnel or material resources, followed by training courses or workshops, IDDSI-oriented market products and publications demonstrating positive implementation effects. Future work should therefore examine these barriers in greater depth, including how institutions operationalise IDDSI testing, assign responsibilities across professions, integrate IDDSI terminology into documentation and food-service workflows, and maintain implementation through training, audit and quality-assurance procedures.

Organisational Conditions for IDDSI Implementation

The regression analysis further supports that IDDSI implementation is best understood as an organisational process rather than a profession-specific task. Although the final model explained only a

modest proportion of variance and no individual predictor reached conventional statistical significance, the pattern of estimates was consistent with implementation theory and previous IDDSI implementation studies (Estrella et al., 2018; Feiner et al., 2025): Internal kitchen organisation showed a positive association with higher implementation status, while absence of an implementation team showed a trend towards lower implementation status.

The trend towards higher implementation status in institutions with internal kitchen organisation is operationally plausible. Implementation requires more than renaming diet categories, but recurrent testing, recipe adaptation, portioning procedures, labelling, staff training, quality assurance and clear communication between and within clinical and food-service teams. This aligns with previous implementation work showing that food-service procedures are a critical implementation domain. Structured implementation projects have described recipe modification, meal audits and ongoing kitchen staff training as central requirements for implementation (Hopper et al., 2022; Wu et al., 2022a; Feiner et al.; 2025). The present findings extend this literature by suggesting that the organisational location of food preparation may also be relevant. Institutions with fully or partly internal food-service structures may have more direct control over recipe testing, staff education and iterative quality improvement than institutions relying primarily on external providers. This may be particularly relevant because texture-modified foods are vulnerable to texture drift across production, holding, transport, portioning and service, and because timely adaptation of recipes, thickeners, portion sizes or food components may be easier when clinical and kitchen teams operate within the same institutional system. By contrast, external food providers and manufacturers of convenience products may face additional constraints related to standardised production, food safety regulations, labelling, procurement contracts, distribution logistics and limited flexibility for site-specific modification. Nevertheless, the increasing reliance on external food-service providers in parts of the healthcare sector means that IDDSI implementation cannot be conceptualised around internal kitchens alone. Future implementation strategies should therefore also address how external providers, convenience-food manufacturers and healthcare institutions can jointly ensure IDDSI-compliant testing, communication, documentation and quality assurance across the full production-to-service chain.

Implementation teams appear to be an important marker of institutional implementation capacity. In the present survey, institutions without an implementation team showed a trend towards lower implementation status, consistent with previous reports that successful IDDSI implementation requires coordinated action across speech and language therapy, dietetics, nursing, medicine, kitchen staff, food-service management and hospital administration (Wu et al., 2022b; Cunningham et al., 2026). Implementation teams may support the translation of IDDSI from a classification framework into routine practice by assigning responsibilities, coordinating training, resolving discrepancies between clinical and kitchen terminology, developing local testing procedures and embedding IDDSI levels into electronic documentation and ordering systems. Moreover, following a bottom-up approach, allied health professionals are crucial drivers in improving patient safety in dysphagia care. At the same time, the presence of an implementation team should not be interpreted as an independent marker of implementation. Institutions may establish such teams because implementation has already begun, because implementation difficulties have become visible, or because local leadership has prioritised dysphagia-related quality improvement.

Although country-specific distributions of harmonised level of care differed substantially and rehabilitation facilities showed a trend towards lower implementation status compared with specialised care hospitals in the final model, this should not be interpreted as evidence that IDDSI is less applicable to rehabilitation settings. Rather, the absence of an independently significant care-level effect supports the broader interpretation that IDDSI implementation is not anticipated based on any single institutional characteristic. IDDSI was developed as a cross-sectoral terminology and testing framework for texture-modified foods and thickened liquids, supporting its use beyond one specific care setting (Cichero et al., 2017). Previous implementation work also indicates applicability across different healthcare contexts: acute-care implementation has required adaptation to hospital-scale food-service systems, documentation and menu cycles (Feiner at al., 2025), while rehabilitation and mixed hospital settings have highlighted the need for setting-specific implementation procedures and staff engagement (Hopper et al., 2022; Cunningham et al., 2026). Evidence from aged-care settings further suggests that sustainable implementation depends on local training, multidisciplinary collaboration and ongoing auditing rather than care sector alone (Wu et al., 2022a; Wu et al., 2022b). Care level may therefore be better understood as one contextual marker within a wider implementation environment, rather than as a direct explanatory factor.

Limitations

Several limitations need to be considered. First, the questionnaire was developed from previous IDDSI-related survey work and adapted to the D-A-CH hospital context. Although implementation status was classified using the MAPA model as a staged implementation framework, the broader survey constructs were not systematically derived from established implementation-science models. Consequently, implementation-related domains such as inner setting, implementation climate, readiness for implementation, implementation process or feasibility and sustainability were not operationalised according to established models such as CFIR or TDF. This limits the extent to which the present findings can be interpreted at the level of validated implementation domains. The survey should therefore be understood as a first institutional mapping of IDDSI knowledge, planning and implementation status rather than as a fully model-based implementation evaluation. Future survey waves should consider translating implementation domains more explicitly into questionnaire items to allow stronger theory-guided interpretation.

Second, although the analytical sample was numerically balanced across Germany, Austria and German-speaking Switzerland, country-specific response rates differed. Similar absolute numbers of responding institutions should therefore not be interpreted as equivalent representativeness. The lower response rate in Germany may have increased susceptibility to non-response bias, particularly because direct access to dysphagia-specific professionals was not always possible and survey invitations were sometimes routed through administrative personnel, heads of units or other institutional gatekeepers. In such cases, response propensity may have depended not only on IDDSI awareness or implementation readiness, but also on whether the invitation reached professionals with sufficient knowledge of local dysphagia and food-service processes. In addition, because the survey explicitly addressed IDDSI knowledge, planning and implementation, institutions with pre-existing IDDSI awareness, professional interest or implementation activity may have been more likely to participate, potentially leading to an overestimation of IDDSI

awareness and implementation engagement. No responses from one German federal state, Lower Saxony, could be included because of technical issues during data collection, which further limits transferability to Germany. Finally, the harmonization of country-specific care-level and provider categories was necessary for D-A-CH comparisons but may have obscured more granular institutional differences within each healthcare system.

Third, the sample size calculation was designed to support institutional survey coverage and descriptive precision, not to power multivariable ordinal regression with multiple categorical predictors and sparse cells. The regression analyses should therefore be interpreted as exploratory. Complete-case modelling reduced the number of observations in the final model, and some categories required collapsing to improve stability and interpretability. Although the final model was statistically significant, individual estimates showed substantial uncertainty, as reflected by wide confidence intervals.

Fourth, several predictors may be structurally interrelated. Food-service organisation differed markedly between countries, and internal kitchen organisation may partly reflect broader institutional characteristics such as country-specific hospital structures, provider type, resource availability, governance or implementation readiness. Although internal kitchen organisation was clinically and operationally plausible as an implementation-related factor, it did not reach statistical significance after adjustment. Similarly, harmonised level of care may act as a contextual marker rather than as an independent explanatory factor. For example, implementation teams may support implementation but may also be established after an institution has already started implementation. The cross-sectional design does not allow causal inference or temporal ordering. Longitudinal data from the planned second survey wave will be needed to examine whether these organisational characteristics predict implementation progression over time.

Overall, from this interpretation, important implications can be derived for implementation practice: IDDSI implementation strategies should not be limited to dissemination of the framework or professional education alone. Instead, institutions should consider structured, context-sensitive implementation planning that includes local stakeholder engagement, co-design of food-service and clinical workflows, defined leadership responsibility, interdisciplinary implementation teams, resource planning, training cycles and audit or feedback procedures. The MAPA model may serve as a practical staging tool for describing institutional progress along the IDDSI implementation pathway, whereas broader implementation frameworks could inform targeted implementation interventions by helping to identify which organisational determinants require assessment, support and change.

Conclusion

This first multi-country, cross-sectional hospital survey showed high IDDSI awareness among responding neurological acute care and rehabilitation institutions in the German-speaking D-A-CH region, but implementation status remained heterogeneous. Implementation levels differed between countries, with lower implementation status in Germany than in Austria and German-speaking Switzerland, although these differences should be interpreted in the context of country-specific structural and organisational variation. The regression analysis suggested that IDDSI implementation is not explained by a single institutional

characteristic; rather, implementation appears to be embedded in broader organisational conditions, including food-service structures, implementation teams and care-level-related contexts. Future longitudinal analyses should examine whether these institutional characteristics predict changes in implementation status over time and should link reported implementation status to audited implementation fidelity, food-service processes and clinically relevant outcomes.

Declarations

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Ethics Statement:

Ethics approval for the Swiss survey component was obtained from the Ethics Committee of the *[removed for blind peer review]* and ethics approval for the German and Austrian survey components was obtained from *[removed for blind peer review]*. Participation was voluntary and pseudonymised.

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Figures

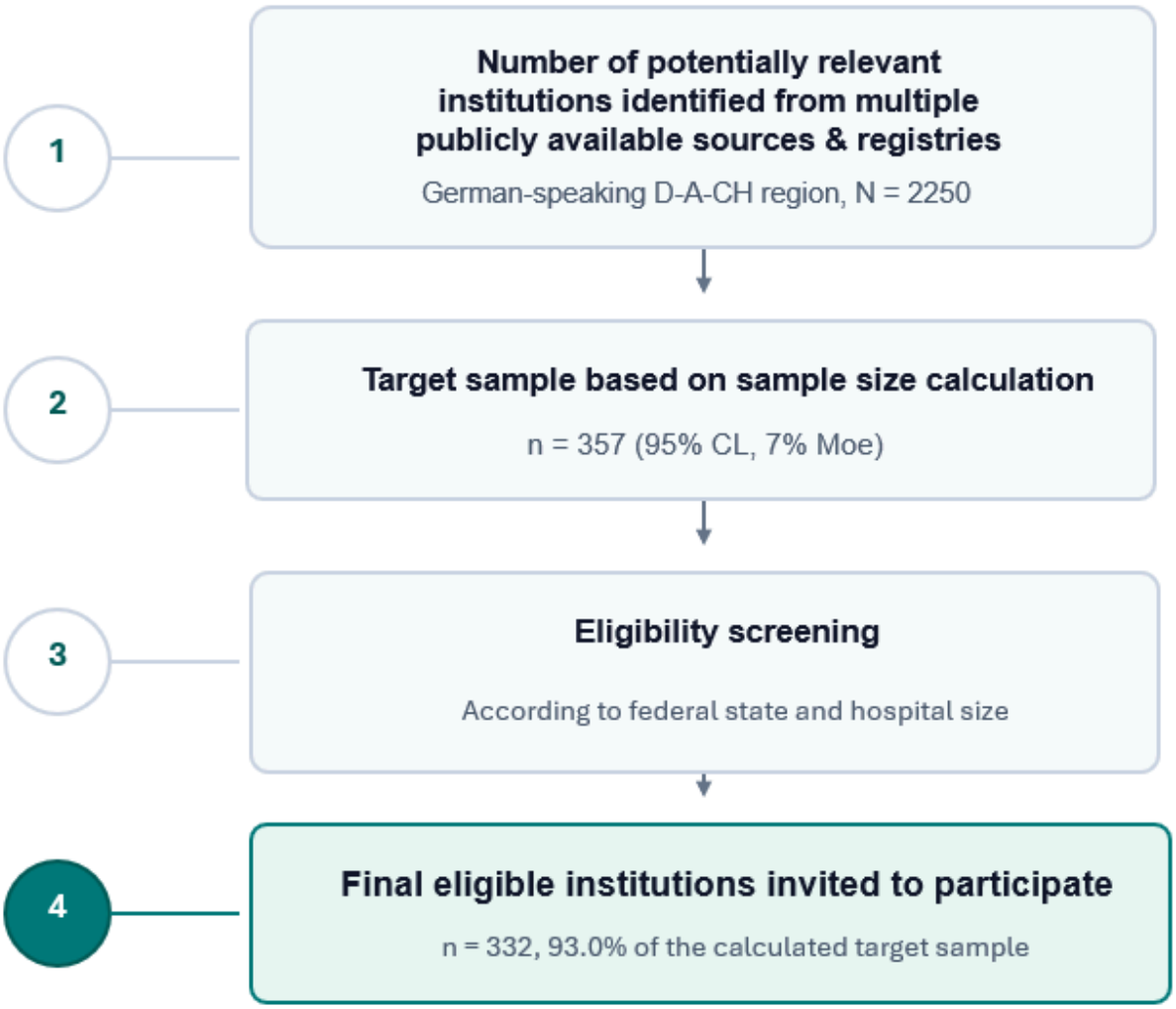


Figure 1

Flow chart of institutional identification, sample size planning, eligibility screening and final invitation of eligible institutions (CL = Confidence Level, MoE = Margin of Error)

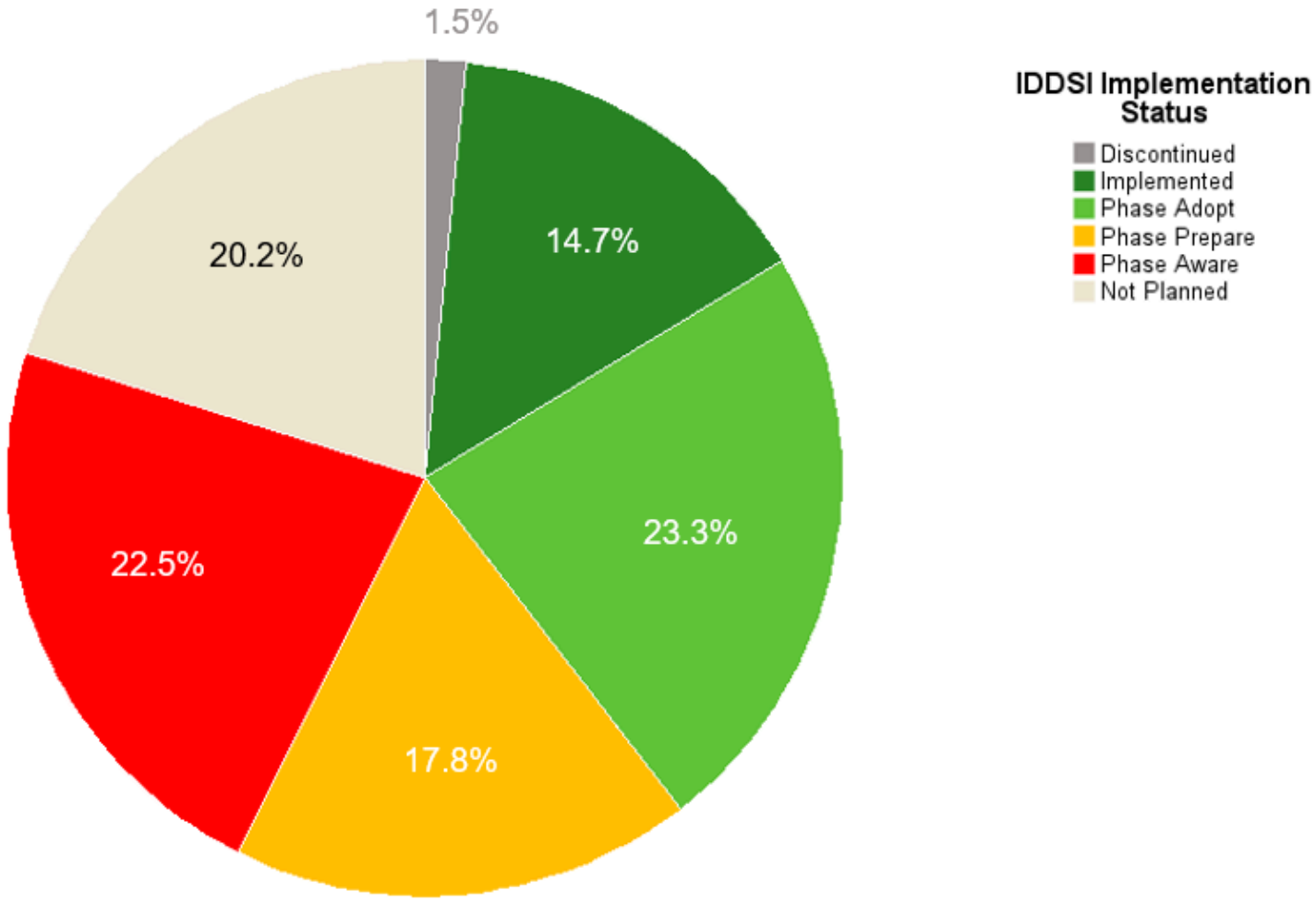


Figure 2

Overall distribution of IDDSI implementation phase according to the MAPA guide (N = 129)

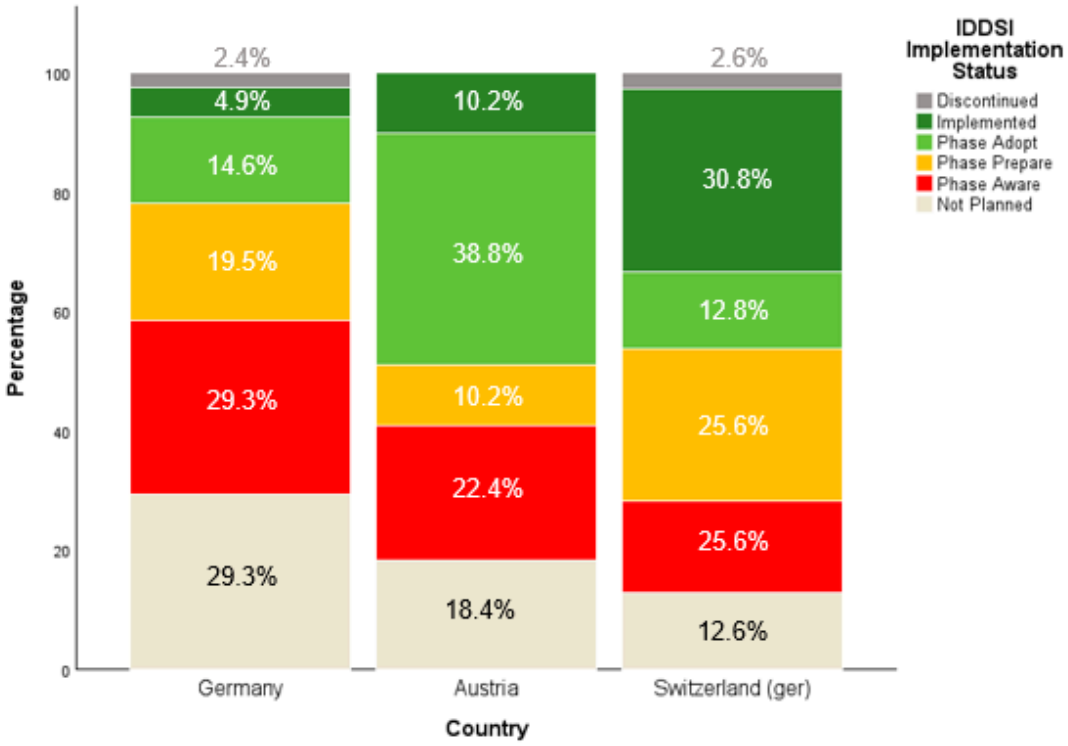


Figure 3

Phases of implementation status according to the MAPA implementation guideline by country (%) (N = 132)