Original article

# Interrater reliability and practicability of the German version of the Ghent Global Incontinence-Associated Dermatitis Categorization Tool

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**Abstract:** *Background:* Incontinence-associated dermatitis (IAD) is a sequela of fecal and/or urinary incontinence with an estimated prevalence rate of 6 % to 27 %. To assess the severity of IAD the Ghent Global IAD Categorization Tool (GLOBIAD) was developed. A German translation of GLOBIAD (GLOBIAD-D) is available, but psychometric testing is pending. *Aim:* The aim of the study was to assess the interrater reliability, practicability and clinical relevance of the GLOBIAD-D. *Methods:* A multicenter study with cross-sectional design was conducted in four health and social care facilities in Germany and Austria including patients/residents with IAD. The overall percentage of observation agreement (POA) and interrater reliability was assessed using data from 23 observations of an IAD. Practicability and clinical relevance were assessed using a self-administered questionnaire. Data analysis was performed using descriptive statistics, Cohen's kappa(κ), and Cramers V. *Results:* A high percentage of observational agreement (n = 22; POA = 68.20 %) and moderate interrater reliability (n = 22; κ = 0.55; 95 % CI [0.28; 0.82]) were obtained with GLOBIAD-D. Practicability and clinical relevance of GLOBIAD-D were rated as good and it was described as a simple, understandable, user-friendly, and time efficient tool. Potential for improvement was seen in image quality as well as description of category 2A. *Conclusions:* GLOBIAD-D shows a high overall POA and was proved to be practical and clinically relevant. Further studies are needed to make recommendations.

**Keywords:** incontinence-associated dermatitis, instrument, reliability, practicability

**Interrater-Reliabilität und Praktikabilität der deutschen Version des Ghent Global Inkontinenz-assoziierte Dermatitis Kategorisierungstools**

**Zusammenfassung:** *Hintergrund:* Die Inkontinenz-assoziierte Dermatitis (IAD) ist eine Folgeerscheinung von Stuhl- und/oder Harninkontinenz mit einer geschätzten Prävalenzrate von 6 % bis 27 %. Zur Beurteilung des Schweregrads der IAD wurde das Ghent Global IAD Categorization Tool (GLOBIAD) entwickelt. *Ziel:* Ziel der Studie war es, die Interrater-Reliabilität, Praktikabilität und klinische Relevanz der deutschen Version des GLOBIAD (GLOBIAD-D) zu beurteilen. *Methoden:* Multizentrische Studie mit Querschnittsdesign in vier Einrichtungen des Gesundheits- und Sozialwesens in Deutschland und Österreich. Eingeschlossen wurden Patient_innen/Bewohner_innen mit IAD. Der Gesamtprozentsatz der Beobachtungsübereinstimmung (POA) und die Interrater-Reliabilität wurden anhand der Daten von 23 Beobachtungen einer IAD bewertet. Praktikabilität und klinische Relevanz wurden mit Hilfe eines Fragebogens erhoben. Die Datenanalyse erfolgte mittels deskriptiver Statistiken, Cohen's Kappa(κ) und Cramers V. *Ergebnisse:* Mit GLOBIAD-D wurde eine hohe prozentuelle Beobachtungsübereinstimmung (n = 22; POA = 68,20 %) und mäßige Interrater-Reliabilität (n = 22; κ = 0,55; 95 % CI [0.28; 0.82]) erzielt. Praktikabilität und klinische Relevanz von GLOBIAD-D wurden als gut eingestuft. Es wurde als einfaches, verständliches, benutzerfreundliches und zeitsparendes Instrument beschrieben. Die Bildqualität und die Beschreibung der Kategorie 2A zeigen Verbesserungspotenziale.

*Schlussfolgerungen:* GLOBIAD-D zeigt einen hohen Gesamt-Beobachtungsübereinstimmung und hat sich als praktisch und klinisch relevant erwiesen. Weitere Studien sind erforderlich, um Empfehlungen auszusprechen.

**Schlüsselwörter:** Inkontinenz-assoziierte Dermatitis, Instrument, Reliabilität, Praktikabilität

**What this study adds**
The German version of the GLOBIAD proves to be practical and clinically relevant and shows high overall percentage of observation agreement.

## Introduction

Incontinence-associated dermatitis (IAD) is an irritant contact dermatitis that can be classified as a type of moisture-associated skin damage (Dissemond et al., 2021; Uebach, 2017). Clinically, IAD manifests as a side effect and secondary disease in people with urinary and/or fecal incontinence (Kayser et al., 2021; Uebach, 2017) and is associated with localized superficial inflammation of the skin (Junkin & Selekof, 2008). IAD leads to increased need for support and care and is associated with high health-related costs (Cunich et al., 2022; Uebach, 2020). Treatment expenses for people with existing incontinence and IAD are up to USD 5.85 higher per case than for incontinent people without IAD (USD 22.83 vs. USD 16.98) because of the increased care required and the large number of care products used (Kayser et al., 2021). People with IAD suffer from physical consequences, such as itching, burning, and pain (Beeckman et al., 2015), as well as from psychological effects, including shame, disgust, and social withdrawal, which have negative impacts on well-being and quality of life (Beeckman et al., 2015; Cunich et al., 2022; Uebach, 2020).

Internationally, the incidence and prevalence of an IAD vary across different settings of health care systems (e.g. hospitals and long-term care facilities). The prevalence rate is estimated to reach 27 % (Arnold-Long & Johnson, 2019; Beeckman et al., 2018; Gray et al., 2012), and the incidence is reported to be up to 60 %, especially in settings with highly vulnerable patients, such as intensive care units (Long et al., 2012; Wei et al., 2019; Zimmaro Bliss et al., 2006). In German-speaking countries, similar rates of incidence and prevalence could be observed. According to Völzer et al. (2023), 21 % of residents in 17 long-term care facilities in Berlin, Germany, suffer from an IAD. Lohrmann (2018) reports an IAD prevalence rate of 4.40 % in a population of patients admitted to hospitals in Austria and a prevalence rate of 3.40 % in residents of long-term care facilities.

The reasons for the different prevalence and incidence rates across the different settings are multifaceted. This could be due to the inclusion of patient populations with different degrees of risk for developing an IAD in the respective studies. Also, different instruments for diagnosing and categorizing an IAD might have been used (Beeckman et al., 2018).

To address the latter problem, the Ghent Global IAD Categorization Tool (GLOBIAD) was developed by an international expert group from 30 countries in 2018 (Beeckman et al., 2018). GLOBIAD divides an IAD into four different severity categories. Each category is described by critical and additional criteria and is illustrated with an example picture of the category to support health care providers in correctly defining the IAD. Category 1A is defined as "persistent redness without clinical signs of infection", category 1B is defined as "persistent redness with clinical signs of infection", category 2A is defined as "skin loss without clinical signs of infection", and category 2B is defined as "skin loss with clinical signs of infection". In addition, GLOBIAD contains a glossary that explains terms related to the topic. It is simple, user friendly, straightforward, and time saving (Beeckman et al., 2018; Hödl et al., 2020) and has been translated into 17 languages and is freely available online (Skin Integrity Research Group, n.d.).

GLOBIAD has been tested with 463 experts from 30 different countries. The experts had to assign images of an IAD to the respective categories described in GLOBIAD. Category 1A showed the highest agreement, whereas a medium level of observational agreement was determined for categories 1B and 2B. Between categories 1 and 2, an almost perfect observational agreement and substantial intrarater reliability could be analyzed (Beeckman et al., 2018).

In 2019, the German version of the GLOBIAD tool was retranslated by researchers from Germany, Switzerland, and Austria (Köberich et al., 2019) based on the principles of the International Society for Pharmacoeconomics and Outcome Research (Wild et al., 2005). The aim of the new translation of the GLOBIAD tool was to provide a culturally sensitive German translation that could be used in all German-speaking countries. The following German version of the GLOBIAD tool is referred to as the GLOBIAD-D.

In order to establish a sound tool for categorizing an IAD for the German speaking setting, psychometric properties, practicability, and clinical relevance of the GLOBIAD-D need to be tested and assessed.

### Aim

Therefore, the aim of this study was to evaluate the interrater reliability, practicability and clinical relevance of the GLOBIAD-D in patients/residents with IAD in different health care settings in Germany and Austria.

 

# Methods

This multicenter study with a cross-sectional design was conducted in four hospitals and long-term care facilities in Germany and Austria. The Guidelines for Reporting Reliability and Agreement Studies (GRRAS) were followed (Kottner et al., 2011).

## Sample and setting

In preparation for this study, a two-step approach for calculating the sample size was planned. First, the aim was to include 20 to 40 patients/residents and use the collected data for an interim analysis to calculate an appropriate sample size for this reliability study. This approach was chosen because, prior to the study, it was unknown how the individual categories of an IAD were distributed. According to Hong et al. (2014), knowledge of the distribution of the individual categories, i.e. the percentage distribution of categories 1A, 1B, 2A, and 2B, and the proportion of agreement is a prerequisite for being able to calculate an adequate sample size. After one year of data collection in Austria at the onset of the COVID-19 pandemic, only eight participants were included in this study. Therefore, based on the unpredictability of the COVID-19 pandemic and due to research economic reasons, data collection was discontinued at a sample size of 25 patients/residents in autumn 2022.

Patients/residents from four German and Austrian hospitals and long-term care facilities with an existing IAD and older than 18 years were included into the study. Patients/residents incapable of making decisions without a legal representative or terminally ill persons were excluded. Patients/residents were recruited in different ways, either by members of the project team or by the participating nurses (observers), who identified and informed the patients/residents and included them in the study.

To assess the IAD category as well as the practicability and clinical relevance of the GLOBIAD-D, nurses were invited to participate as observers in this study. Recruitment of observers was carried out by the respective project team at the four research sites in verbal and written form. Nurses (observers) were eligible to participate in this study if they were involved in the care of patients/residents with IAD and had a formal education in nursing (diploma degree in nursing or nursing assistant degree). Nurses were excluded if they worked as executive managers without any patient contact.

All nurses included in this study received a one-hour standardized training from the study coordinators. The training was based on written and digital information materials and included the following topics: definition of IAD, etiology, risk factors, localization, and challenges in identification, specifically the demarcation to pressure injuries. Differences in the four IAD categories were discussed in depth using the GLOBIAD-D. In addition, the nurses received formal training to use the data collection work sheets.

## Data collection procedure

### Interrater reliability

Interrater reliability is defined as "the degree to which two or more raters are able to differentiate among subjects or objects under similar assessment conditions" (Kottner et al., 2011, p. 104). To determine the interrater reliability of the GLOBIAD-D categorization instrument an observation sheet was used. The IADs of all participants were independently classified by two nurses using two separate observation sheets within one hour after cleaning the affected skin regions and within a one-minute delay between the two assessments. A time frame of one hour was chosen to ensure that the clinical appearance of the IAD was stable. The nurses were encouraged to integrate the IAD category assessment into their daily care routines, for example, while changing incontinence products, to minimize patients'/residents' burden of being part of this study. To assess the interrater reliability of the assessed IAD category, both nurses were instructed to perform the categorization independently, autonomously and without consultation, and to independently document their results on the IAD category assessment given by the GLOBIAD-D. The IAD could be assigned to one of the four categories 1A, 1B, 2A or 2B. Adherence to the measurement procedures was not monitored by the study team. The observation sheet was put into envelopes by nurses, sealed and placed into boxes or handed out toward the study coordinator.

To describe the characteristics of the patients/residents following data were collected: age, sex and type of incontinence (urinary, fecal or both).

### Practicability and clinical relevance of the GLOBAID-D

Application-related quality criteria set specific evaluation standards for nursing practice and ultimately influence the likelihood of adequate use of nursing-related assessment instruments. Accordingly, these should be comprehensible, resource-friendly and easy to use. Clinical relevance integrates the objective and significance in the context of care and support (Reuschenbach, 2020). The practicability and clinical relevance of the GLOBIAD-D was tested using a questionnaire. The questionnaire was solely developed for this study and was based on definitions by Mayer et al. (2018) (simplicity, understandability, and time to use) and by Reuschenbach (2020).

The questionnaire comprises five dimensions: (1) simplicity of the instrument and the glossary; (2) understandability of the instrument and the glossary; (3) time to use the instrument; (4) relevance of the instrument and the glossary; and (5) an overall judgment of the instrument and the glossary. Simplicity, understandability, and relevance were assessed using a 4-point Likert scale (1 = totally agree, 2 = agree, 3 = disagree, 4 = totally disagree). The "time to use" was assessed in minutes, without preparation or follow-up time. The overall judgment could be rated from very good (= 1) to insufficient (= 5). The nurses were given the possibility of adding comments to each di-

mension and were asked about the strengths or limitations of the GLOBIAD-D using open answers. The nurses were asked to complete the questionnaire after an IAD categorization at least once.

To describe the sample of nurses who participated in this study, the nurses were asked to complete a questionnaire containing questions about age, sex, and qualifications (e.g. special education as a wound manager or incontinence manager).

### Data analysis

The data were analyzed using SPSS, version 26.0 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.) and Microsoft Excel 365 (Microsoft Corporation, 2018). The Shapiro-Wilk test was used to assess the distribution of the metric data.

After calculating the nonrandomly adjusted observation matches (De Vet et al., 2011) using descriptive statistics (n, %) of the GLOBIAD-D categories 1A, 1B, 2A, and 2B between two nurses, Cohen's kappa (κ) was calculated for nominally scaled data to determine the interrater reliability. The results were interpreted according to Landis and Koch (Landis & Koch, 1977). Kappa values > 0.80 were considered almost perfect, > 0.60 was considered substantial, > 0.40 was considered moderate, and > 0.20 was considered moderate. A value between 0.00 and 0.20 was defined as low agreement, and a value less than 0.00 was defined as poor agreement (Landis & Koch, 1977). The significance of the observed correlation between the two nurses was tested using Fisher's exact test (Wirtz & Caspar, 2002). To calculate the strength of the correlation between the nurses, Cramer's V was determined (Wirtz & Caspar, 2002).

Descriptive statistics were used to analyze the practicability and clinical relevance of GLOBIAD-D. Furthermore, text in the open answers was freed from filler words, paraphrased, and summarized and displayed as frequencies.

## Results

### Characteristics of patients and residents

Overall, 23 patients/residents were included in this study. Of these 23 patients/residents, 18 (78 %) were from Austria and five (22 %) from Germany. Seven patients (30 %) were recruited from two hospitals, eight residents (35 %) from two long-term care facilities, and eight (35 %) from one home for the handicapped. The mean age of the patients/residents was 74.68 years (standard deviation [SD] 17.90). Thirteen patients/residents (57 %) suffered from double-incontinence (fecal and urinary incontinence), six patients/residents (26 %) from fecal incontinence, and four (17 %) from urinary incontinence.

### Characteristics of the nurses

To assess the category of IAD among patients/residents and to evaluate the practicability and clinical relevance of the GLOBIAD-D, nurses were recruited for this study. In total 21 nurses participated. Of these 21 nurses, 15 (71 %) were female and 6 (29 %) were male. The mean age of the participating nurses was 39.40 years (SD 8.20). Most of the nurses (n = 20; 95 %) had a formal nursing education of three years, and one nurse aid had two years of education. Seven of the 21 nurses (33 %) held a certification for wound management, and two nurses (10 %) held a certificate for continence and ostomy consultation. One nurse was certified as an anesthetics/intensive care nurse, and another nurse was a certified palliative care nurse.

### Interrater reliability and observation agreements

Results of 22 IAD assessments were included in the analysis. One assessment had to be excluded due to missing data (Table 1).

A comparison of the IAD assessments of the different nurses revealed that the categories with the highest agreement were category 1A and 1B, followed by category 2B (Table 1), with absolute agreement of observation (POA) of approximately 90 % in these categories (1A: 86.40 %, 1B: 90.91 %, 2B: 90.91 %) as well as substantial interrater reliability (κ = 0.61–0.72) (Table 2). Independently conducted assessments of category 2A by two nurses showed POA of 68.20 % and a low kappa value (κ = 0.15).

**Table 1.** Observation agreements of IAD categories using GLOBIAD-D

| | | Nurses #2 | | | | |
|---|---|---|---|---|---|---|
| | | 1A | 1B | 2A | 2B | Sum (n) |
| Nurses #1 | 1A | 8 | 0 | 2 | 0 | 10 |
| | 1B | 0 | 3 | 1 | 0 | 4 |
| | 2A | 1 | 1 | 2 | 1 | 5 |
| | 2B | 0 | 0 | 1 | 2 | 3 |
| Sum (n) | | 9 | 4 | 6 | 3 | 22[a] |

*Notes*: Nurses: observers, Sum (n): accumulated assessments of IAD, [a]: One missing assessment.

**Table 2.** Results of observation agreements and interrater reliability of the GLOBIAD-D (n = 22)[a]

| Category | Kappa(κ) | 95 % CI | POA % | PE % | p[b] |
|---|---|---|---|---|---|
| 1A | 0.72[d] | 0.43; 1.00 | 86.40 | 50.83 | < 0.01 |
| 1B | 0.69[d] | 0.30; 1.00 | 90.91 | 70.25 | 0.01 |
| 2A | 0.15[c] | −0.29; 0.60 | 68.20 | 62.40 | 0.56 |
| 2B | 0.61[d] | 0.13; 1.00 | 90.91 | 76.45 | 0.04 |

*Notes*: CI: Confidence interval; POA: Percentage of observation agreement; PE: Percentage of expected agreement; [a]: One missing assessment; [b]: Fisher's exact test; [c]: p ≥ 0.05; [d]: p ≤ 0.05.

Overall, a high POA (68.20 %) and moderate interrater reliability (κ = 0.55; 95 % CI: 0.28; 0.82) were found. The assessments of the categories conducted by the two nurses were strongly correlated (V = 0.62).

### Practicability and clinical relevance

Seventeen out of 21 distributed questionnaires (81 %) assessing the practicability and clinical relevance of the GLOBIAD-D were returned.

All items regarding the simplicity of the displayed categories and of the glossary, the understandability of the textual description of every single category and all the items regarding the relevance of GLOBIAD-D were answered with "totally agree" or "agree". Items on the pictorial representation of the categories were rated less well (Table 3).

Overall, the GLOBIAD-D was rated as a good instrument (mean: 1.90; SD 0.72; median: 2; minimum: 1; maximum: 3). The glossary was rated as very good (mean: 1.38; SD 0.50; median: 1; min: 1; max: 2).

To categorize the IAD of patients/residents, nurses needed 4.94 minutes (SD 4,10; median: 5; min.: 1; max.: 15), excluding time for preparation and follow-up.

Seventeen nurses took the opportunity to comment on GLOBIAD-D using free text boxes. Within the comments, the categorization tool was described as simple, understandable, and time-efficient with a high level of user friendliness. However, it was stated that more pictures (two examples per category) would be helpful for correctly categorizing an IAD, although the GLOBIAD-D was deemed as very comprehensive overall. In the comprehensibility dimension, it was noted in eleven cases that the resolution of the example images was too low or not clear enough, indicating a potential area for improvement of the GLOBIAD-D.

## Discussion

The aim of this study was to examine the interrater reliability, practicability, and clinical relevance of the GLOBIAD-D categorization instrument in patients/residents with existing incontinence-associated dermatitis in hospitals and long-term care facilities in Germany and Austria.

Overall, the GLOBIAD-D achieved substantial percentage of observation agreement and moderate interrater reliability for the assignment of one of four IAD categories by two nurses. The practicability and clinical relevance were rated as good overall. The GLOBIAD-D was described as a simple, understandable, user-friendly, and time-efficient categorization tool. There was potential for optimization in image quality and in the description of category 2A.

The nurses in this study most frequently categorized category 1A, followed by category 1B, 2B, and category 2A. Almost perfect POA was calculated for categories 1A, 1B, and 2B, while a high POA was calculated for category 2A. However, the agreement rate in category 2A (68 %)

**Table 3.** Results on the practicability and clinical relevance of the GLOBIAD-D (n = 17)

| | Totally agree n (%) | Agree n (%) | Disagree n (%) | Totally disagree n (%) |
|---|---|---|---|---|
| Simplicity | | | | |
| The categorization tool is clearly arranged. | 14 (82.40) | 3 (17.60) | – | – |
| The categorization tool is user-friendly. | 11 (64.70) | 6 (35.30) | – | – |
| The glossary is clearly arranged. | 14 (82.40) | 3 (17.60) | – | – |
| The glossary is user-friendly. | 13 (76.50) | 4 (23.50) | – | – |
| Understandability | | | | |
| Category 1A – Text is understandable (n = 17) | 15 (88.20) | 2 (11.80) | – | – |
| Category 1A – The pictorial representation is supportive (n = 17) | 11 (64.70) | 6 (35.30) | – | – |
| Category 1B – Text is understandable (n = 17) | 15 (88.20) | 2 (11.80) | – | – |
| Category 1B – The pictorial representation is supportive (n = 16) | 11 (68.80) | 4 (25.00) | 1 (6.30) | – |
| Category 2A – Text is understandable (n = 17) | 16 (94.10) | 1 (5.90) | – | – |
| Category 2A – The pictorial representation is supportive (n = 17) | 10 (58.80) | 6 (35.30) | 1 (5.90) | – |
| Category 2B – Text is understandable (n = 17) | 14 (82.40) | 3 (17.60) | – | – |
| Category 2B – The pictorial representation is supportive (n = 17) | 10 (58.80) | 7 (41.20) | – | – |
| Relevance | | | | |
| Categorization of the IAD is possible (n = 16) | 12 (75.00) | 4 (25.00) | – | – |
| GLOBIAD-D is helpful for nursing practice (n = 17) | 11 (64.70) | 6 (35.30) | – | – |
| GLOBIAD-D is suitable for practice (n = 17) | 9 (52.90) | 8 (47.10) | – | – |
| The glossary is helpful when using GLOBIAD-D (n = 17) | 11 (64.70) | 6 (35.30) | – | – |
| The glossary is helpful for nursing practice (n = 17) | 12 (70.60) | 5 (29.40) | – | – |

should be interpreted with caution, as approximately one-third of the assessments disagreed. This indicates that every third evaluation differs, which calls into question the consistency of the judgments and highlights potential inconsistencies in the assessment process. The results of Beeckman et al. (2018) showed substantial POA in category 1A (72%). In contrast, moderate observational agreement (47%) was found for category 2A (50%), 1B (47%), and 2B (47%) tumors (Beeckman et al., 2018).

The available results for interrater reliability showed substantial kappa values for categories 1A, 1B, and 2B. For category 2A, only a low kappa value could be determined. Due to discrepant marginal distributions and the high number of disagreements in the IAD categorization of category 2A, the calculations resulted in a low kappa value, despite identical observational agreement. Assuming that the categories cannot be ranked (e.g. "less bad" to "very bad") but describe different clinical manifestations, they should therefore be regarded as nominal variables. For this reason, a weighted k and Fleiss k were not calculated. The results indicate interrater reliability, but the discrepancies suggest that the text descriptions and image material of category 2A need to be adjusted as mentioned by the observer. A moderate interrater reliability was found in the overall assessment across all four categories of the GLOBIAD-D. Beeckman et al. (2018) also achieved satisfactory results (Fleiss-κ = 0.41) between the four categories.

To our knowledge, for the first time, in this study, the practicability and clinical relevance of the GLOBIAD-D were examined. According to the results, the GLOBIAD-D is a simple, comprehensible, and time-efficient categorization tool with a high degree of user friendliness and clinical relevance and thus meets the objective of Beeckman et al. (2018), who also evaluated and revised the structure (comprehensibility and visual material) of the GLOBIAD. The available results from our study show potential for optimization in the areas evaluated by Beeckman et al. (2018). The need for further image material and better quality is postulated.

The results from small samples provide valuable information for future studies and should be integrated into follow-up studies as an internal pilot study (Arain et al., 2010; Thabane et al., 2010). A strength of the present study is that data collection via the GLOBIAD-D was carried out under real conditions on patients/residents. In contrast, the results of the psychometric testing of the original version by Beeckman et al. (2018) are based on photodiagnostic assessments from an online survey of 463 experts from 30 countries. However, with the two-dimensional perspective of photos, signs of infection (warmth, swelling, pain and itching) could not be taken into account (Beeckman et al., 2015).

The checklist for the data collection process in this study was proven helpful for the nurses, especially because the data collection took place sporadically over a long period of time. Overall, nurses described the time required for data collection as not disruptive and shorter than expected. This is consistent with the information provided by Beeckman et al. (2018). However, the factors for testing feasibility were not considered in the objectives of this study, but the results suggest that a larger-scale study would be feasible.

Further limiting factors can be derived from the study in line with Thabane et al. (2010), which could be interesting and helpful for future studies. One limitation of this study is the small sample size. The planned sample size was not achieved. The inability to reach the intended sample size could be due to the challenges of the COVID-19 pandemic (Kricheldorff, 2022), the increased demands, the scarcity of resources (Kalisch et al., 2009), and the implicit rationing of nursing and care activities (Cartaxo et al., 2022). Accordingly, in this study, the clinical picture of IAD may not have been continuously recorded or documented for time and practical reasons.

The observation worksheet for determining the interrater reliability of the GLOBIAD-D proved to be practicable overall. However, the recording of demographic data and the form of incontinence experienced by patients/residents, which should be recorded only once, could be improved to avoid repetition and increase the efficiency of the data collection. In nursing practice, especially in extramural care settings, it is rarely possible to rely on nursing staff with expertise in the areas of continence and stoma counseling as well as wound management. A lack of knowledge about the clinical picture of IAD could have led to a lower number of IAD identifications or to misjudgments regarding the differentiation from pressure ulcers. The exchange and transfer of information between caregivers and misjudgments of pathological skin changes may have impacted the data collection.

The influence of professional experience in healthcare and nursing and an additional qualification (e.g. continence and stoma counseling, wound management) were not considered in this study. A differentiation regarding the professional experience and additional qualifications of the nurses should be made in follow-up studies to be able to present critical comments on the practicability of the GLOBIAD-D in a more differentiated manner.

## Conclusions

This study is the first to examine the interrater reliability, practicability, and clinical relevance of the German translation of the Ghent Global IAD Categorization Tool (GLOBIAD-D in patients/residents of health and long-term care facilities in Germany and Austria. The results confirm moderate reliability in terms of interrater reliability. In terms of practicability and relevance, the GLOBIAD-D categorization tool was described as a simple, comprehensible, and time-efficient categorization tool with a high degree of user friendliness and clinical relevance. The potential for optimization was particularly evident in the areas of image quality and better differentiation in category 2A.

 

To make meaningful recommendations for nursing practice and research, further investigations based on larger-scale studies are required. According to Hong et al. (2014) and based on our results, with rounded distribution rates of the IAD-Categories (1A: 50 %, 1B: 20 %, 2A: 20 %, and 2B: 10 %) and an agreement rate of approximately 70 % with an assumed 1 0 % variance, 160 patients/residents should be included. Studies on the prevalence, health-related costs, and level of knowledge of caregivers regarding the clinical picture of IAD also appear to be useful for German-speaking countries.

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**History**
Received June 18, 2024
Accepted March 11, 2025
Published online April 8, 2025

**Authorship**
Manuela Hödl, Margareta Jukic-Puntigam, Alfred Steininger, Gerhard Müller, Christine Spitz-Köberich, Stefan Köberich conzeptualized the study. Angela Flörl, Gerhard Müller, Lára Rún Hallsson analysed the data. Angela Flörl wrote the first draft of the manuscript. All authors were responsible/involved in data collection, read, revised critically the manuscript, and have approved the final version of the manuscript. All authors agree to be accountable for all aspects of the manuscript.

**Publication ethics**
The study protocol was reviewed by the respective ethical committee of the participating institutions and was approved (Albert-Ludwigs-Universität Freiburg, Germany [Nr. 21 – 1329]; Medical University of Graz, Austria [Nr. 32 – 375]; Hospital of the Brothers of St. John of God Vienna, Austria; Research Committee for Scientific Ethical Questions of the UMIT TIROL – University for Health Sciences and Technology, Hall in Tirol and the Health University of Applied Sciences Tyrol, Innsbruck, Austria [Nr. 2981/21]). All nurses were informed about the purpose, aim, and data collection process of the study before providing written informed consent. All the participating nurses or the local study coordinator invited patients/residents with an IAD. Patients/residents with an IAD or their legal representatives had to give written informed consent.

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