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Research Article

Translation and Cultural Adaptation in Italian Language of the DKT-ICN-ITA (Delirium Knowledge Test) for Intensive Care Nurses: A Pilot Study

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What is already known on this topic?

- *Intensive care unit (ICU) delirium is an acute, typically reversible syndrome with a fluctuating course. It is caused by the interaction of predisposing and precipitating factors and presents diverse clinical manifestations that complicate its diagnosis, especially in the hypoactive form, which is most common in intensive care units.*
- *Despite its high prevalence following high-risk surgeries and in ICUs, delirium remains under-recognised due to healthcare professionals' limited knowledge, the lack of routine use of validated assessment tools and the difficulty in identifying the hypoactive subtype.*
- *Evidence shows that nurses' level of knowledge is directly linked to rates of delirium diagnosis, and failure to detect delirium is associated with poorer clinical outcomes and increased healthcare costs.*

Abstract

AIM : This study aims to adapt the Delirium Knowledge Test for Intensive Care Nurses to Italian culture.
METHODS: The study consisted of two phases: an initial linguistic-cultural adaptation phase, followed by content and face validation. The study involved 13 experienced ICU nurses from Terni Hospital. Content validity was assessed by calculating the Content Validity Ratio (CVR) and Item-Content Validity Index (I-CVI) and Scale-Content Validity Index (S-CVI) according to expert opinions. Face validity was determined by a qualitative analysis of the expert panel's responses to an open-ended question regarding item clarity.
RESULTS: The DKT-ICN-ITA achieved a good degree of agreement among the evaluators (Fleiss's K = 81%). For content validity, scores above the cutoff value were achieved (CVR > 0.57; S-CVI/UA = 0.96; S-CVI/AVE = 0.9; I-CVI ≥ 0.78). For the face validation, most experts (8/10) agreed that the items were clear and accessible.
CONCLUSIONS: The translation and validation steps yield satisfactory results. This study aims to provide the Italian scientific community with a validated tool to test skills on delirium in ICU nurses.
Keywords *Delirium, intensive care, knowledge test, nursing*

Introduction

Delirium is a mental status disorder with a variable course that develops over a relatively short period of time, from a few hours to a few days, in the absence of pre-existing neurocognitive disorders. The Diagnostic and Statistical Manual of the American Psychiatric Association (2022) describes it as a transient clinical syndrome with acute or subacute onset, fluctuating course, and reversibility, characterized by spatiotemporal disorientation associated with mental confusion, inattention, disorganized thinking, hallucinations, and an altered sleep-wake rhythm (American Psychiatric Association [APA], 2022).

Based on the clinical manifestation, three main forms of delirium can be distinguished: the hyperactive form (25%), characterized by restlessness, irritability, hypervigilance, hallucinations, and rapid and abrupt mood changes. It represents the rarest form in the Intensive Care Unit (ICU) and presents better outcomes than the other two subtypes: the hypoactive form (25%), the most common in the ICU and associated with an inauspicious prognosis; it manifests with lethargy, apathy, reduced psychomotor activity, decreased response to external stimuli, and, in some cases, states of unconsciousness; and the mixed form (50%): patients present with mixed delirium symptoms alternating moments of lethargy with others of physical and/or

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What this study adds on this topic?

- *This study provides the first Italian validation of the Delirium Knowledge Test for Intensive Care Nurses (DKT-ICN), offering a reliable and culturally adapted tool to assess ICU nurses' competencies regarding delirium.*
- *DKT-ICN offering a reliable and culturally adapted tool to assess ICU nurses' competencies regarding ICU delirium.*
- *It contributes to improving delirium awareness, addressing training gaps, and ultimately enhancing the quality of care and clinical outcomes for critically ill patients.*

verbal aggression. Typically, daytime lethargy is replaced by psychomotor agitation and confusional state at night. The mixed subtype is the second most common form of Delirium in the ICU (Giusti and Mistraletti, 2018).

The prevalence of delirium tends to be high in different therapeutic settings, especially in elderly individuals, and is most common after high-risk surgical procedures (45%) and in the ICU, where the prevalence of ICU Delirium is in the range of 22–47% for patients on spontaneous breathing and 60–85% for those on mechanical ventilation (Watt et al., 2019). In the ICU, mixed and hypoactive delirium is the most common form of delirium, while only a small minority of patients in the ICU (<5%) manifest hyperactive delirium (Krewulak et al., 2018).

Currently available evidence agrees with the hypothesis of a multifactorial etiology, resulting from the interaction of predisposing factors such as older age (Hayhurst et al., 2016), brain pathologies (Sajjad et al., 2018), metabolic imbalances (Van Den Boogaard et al., 2012), and triggers such as surgery (Veiga et al., 2012), ICU admissions (Oldroyd et al., 2017), benzodiazepine use (Hughes et al., 2012), dehydration, and malnutrition (O'Mahony et al., 2011).

The multiple clinical manifestations make Delirium syndrome an elusive clinic and difficult diagnostic framing; diagnosis is based on positivity to DSM-V criteria and involves the use of validated detection instruments. The Confusion Assessment Method for the ICU (Ely et al., 2001) and the Intensive Care Delirium Screening Checklist (Bergeron et al., 2001) are the most recommended scores for the diagnosis of ICU Delirium and currently possess the best reliability and validity scores (Devlin et al., 2018). Laboratory and instrumental investigations aimed at detecting any systemic inflammatory processes or metabolic imbalances responsible for alterations in the neurotransmitter systems (acetylcholine, dopamine, serotonin, norepinephrine, glutamate, and Gamma-aminobutyric acid) implicated in the pathophysiology of delirium (Hughes et al., 2012).

Delirium is known to significantly affect the costs to healthcare providers by worsening the clinical and care outcomes of patients. Although the incidence of this syndrome is very high, its detection is lacking (Giusti and Mistraletti, 2018). The reasons can be attributed to a lack of knowledge about delirium among healthcare professionals (Roh, 2021), the lack of validated detection tools (Spronk et al., 2009), and the absence of routine assessment (Roh, 2021) to a difficult differential diagnosis of dementia and to poor recognition of the hypoactive form (Rice et al., 2011).

Similarly, delirium education programs have been shown to be effective in filling the knowledge gaps among healthcare personnel (Detroyer et al. 2016). The aim of this study was to translate into Italian the cultural adaptation of the Delirium Knowledge Test (DKT-ICN), to have available, even in Italy, a tool that could investigate Delirium skills in ICU nurses and the eventual educational needs of this critical issue.

Methods

The DKT-ICN: The Original Tool

The DKT-ICN is an instrument created by Öztürk Birge et al. (2020) to test ICU nurses' knowledge of ICU Delirium. This study was conducted in four major hospitals in Ankara, Türkiye. The questionnaire, developed in Turkish and English, consists of 26 items investigating the causes and risk factors of delirium (items 1, 4–7, 9–11, 16, and 18), symptoms and subtypes (items 14, 17, and 20), outcomes (items 3, 24, and 25), detection mode (items 12, 15, and 21), and treatment (items 2, 8, 13, 19, 22, 23, and 26). Out of a total of 26 items, seven are false (items 1, 6, 8, 10, 19, 20, and 24) and 19 are true: the highest total score that can be obtained is 26. No cutoff points related to sufficient knowledge levels were identified. The mean total DKT-ICN score obtained from nurses participating in the original study was determined to be 14.61 ± 5.01 (1–25). All items covered in the test were consistent with the Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption guidelines (Devlin et al., 2018). The difficulty level of DKT-ICN was found to be 0.56; the test was found to have a medium level of difficulty. In test-development studies, the difficulty level of a test is expected to be approximately 0.50 (Büyüköztürk et al., 2016; Kılıç and Sağlam, 2009). The Cronbach's α coefficient of the final version was 0.83, and the small number of questions and moderate level of difficulty (0.56) make the DKT-ICN a manageable tool that is easy to use in nursing practice.

Study Design
This is a methodological study

Sample
The Italian language translation and cultural adaptation study involved 13 experienced ICU nurses from Terni Hospital recruited according to a criterion of educational and professional convenience, as they are representative of the professional context to which the test is dedicated, and by virtue of the work and educational path completed. Nurses with at least five years of experience in ICU and with a post-basic degree (Critical Care Post Graduate Certification or Master of Science Nursing) were considered "experts." In the absence of the latter, nurses with at least 15 years of ICU experience were considered as experts (Table 1).

Study Process
The study consisted of two steps: an initial 5-step linguistic-cultural adaptation phase (step 1), for which Beaton's Guidelines (Beaton et al., 2000) were taken into account, followed by content and face validation (step 2), following Polit's guidelines (Polit et al., 2007) (Figure 1).

Cultural and Linguistic Adaptation
The study began in November 2022 when, after obtaining the author's consent (November 3, 2022), two native Italian-speaking translators with an excellent command of English, a clinician and a "naïve translator" (without clinical background) were asked to make two independent translations of the DKT-ICN from English to Italian (forward translation) identified as (T1) and (T2).

Table 1.
Characteristics of Participants in the Whole Adaptation and Validation Study

Study Participants		*n*	%
Age	20–25	1	10
	26–34	4	40
	35–54	7	70
	55–64	1	10
	>64	0	0
Sex	M	9	90
	F	4	40
Years of work experience	0–1	0	0
	2–10	6	60
	11–20	6	60
	>20	1	10
Years of intensive care	0–1	0	0
	2–10	9	90
	11–20	3	30
	>20	1	10
Post-graduate courses	Master Level I	5	50
	Master of Science Nursing (MSN)	2	20
	Master Level I and MSN	1	10
	PhD, Master Level I and MSN	2	20
	None of the above	3	30

Between January and February 2023, a synthesis of the first two translations (T-12) was put together, and a back-translation of the latter from Italian to English was carried out at a later stage, which is essential to ensure content equivalence between the target and original versions. The two translators identified for the back-translation were both native English speakers and proficient in Italian. The text was translated independently and blindly, resulting in two separate back-translations (BT1 and BT2): as with forward translation, a summary of the two versions was produced (BT-12).

Subsequently, the author of the original instrument was asked for his opinion about the work done until then (February 15, 2023).

The last part of the cultural adaptation process consisted of a meeting held in the first week of March 2023, during which all the materials produced in the previous steps were analyzed by all the translators involved in the translation process, leading to the drafting of a single shared instrument: an experimental version of the Delirium Knowledge Test in Italian (DKT-ICN-ITA).

This version was examined by ten nurses from Terni Hospital, with experience in ICUs, recruited according to a criterion of educational and professional convenience (Table 2), who evaluated the comprehensibility and quality of the syntactic form of the translated items by scoring each item on a 4-point Likert scale: 1 = Inappropriate; 2 = Important change; 3 = Mild change; 4 = Appropriate. The degree of agreement among nurses was objectified through Fleiss' K.

Content and Face Validity
The second phase of the cultural adaptation process took place between April and May 2023. Ten nurses (seven from the same language and cultural adaptation group and three newly recruited) were asked to rate the relevance of each item (Table 3). A 4-point Likert Scale was used: 1 = Not relevant, 2 = Somewhat relevant, 3 = Quite relevant, and 4 = Highly relevant. The measurement indices obtained were objectified by calculating the Content Validity Ratio (CVR) and Content Validity Index (CVI), and this latter one was calculated for each item (Item-CVI = I-CVI) and for the whole instrument (Scale-CVI = S-CVI). For the S-CVI, the acceptability cut-off with more than 5 is ≥ 0.80; for the I-CVI, the acceptability cut-off with more than 5 is ≥ 0.78 (Polit and Beck, 2006; Wilson et al., 2012; Lawshe, 1975; Lynn, 1986). The CVR was calculated according to Lawshe's formula (Lawshe, 1975): CVR = (Ne−N/2)/(N/2) where "Ne" indicates the number of experts who responded "essential" and "N" is the total number of experts involved.

Face validation consisted of administering, to the same group of nurses, an open-ended question regarding the clarity of the items: the nurses were first asked to answer the test questions and then to assess the readability and integrity of the questions by answering the question "Does the form and vocabulary adopted in writing the items make the questionnaire sufficiently clear and understandable?" The responses were analyzed qualitatively through a thematic content analysis approach, taking into account some proposed elucidations of the language form of the items (Lynn, 1986; Thorne, 2000).

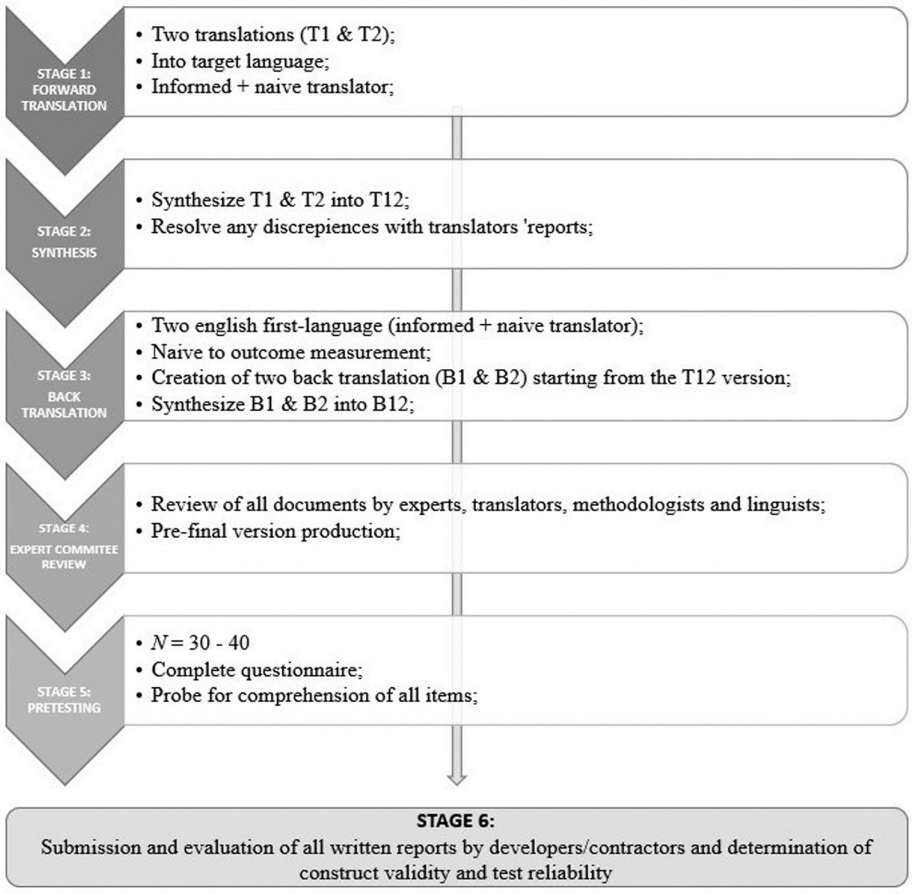

Figure 1.
Stages in the Process of Linguistic-Cultural Adaptation.

Ethical Considerations

The study obtained the necessary approval from the Management Direction of Terni Hospital and was not brought to the attention of the Ethics Committee because it did not involve patients, but only nurses. CER Umbria (Date: 22.02.2024) confirms that the committee is aware of the study but has decided ethic committee approval is not required. Participants received written and oral information about the nature of the investigation; their informed consent to participate in the study and authorization to process personal data were acquired, in full compliance with the Italian Privacy Code (Italian Legislative Decree 196/2003 and 101/2018), before proceeding to data collection. Participants could choose not to participate or withdraw from the study at any time before its completion. All data were processed, analyzed, and presented in an aggregate form. Confidence of information was ensured during the study, no sensitive data were acquired, and no individual participant could be traced. The study protocol was designed in accordance with Good Clinical Practice, and the study was conducted in accordance with the Declaration of Helsinki and Regulation (EU) 2016/679 of the European Parliament and Council of April 27, 2016.

Table 2.
Characteristics of Language Validation Participants

Study Participants		*n*	%
Age	20–25	1	10
	26–34	4	40
	35–54	4	40
	55–64	1	10
	>64	0	0
Sex	M	7	70
	F	3	30
Years of work experience	0–1	0	0
	2–10	3	30
	11–20	6	60
	>20	1	10
Years of intensive care	0–1	0	0
	2–10	6	60
	11–20	3	30
	>20	1	10
Post-graduate courses	Master Level I	5	50
	Master of Science Nursing (MSN)	1	10
	Master Level I and MSN	1	10
	PhD, Master Level I and MSN	1	10
	None of the above	2	20

Table 3.
Characteristics of Content Validation Participants

Study Participants		*n*	%
Age	20–25	0	0
	26–34	4	40
	35–54	5	50
	55–64	1	10
	>64	0	0
Sex	M	6	60
	F	4	40
Years of work experience	0–1	0	0
	2–10	3	30
	11–20	6	60
	>20	1	10
Years of intensive care	0–1	0	0
	2–10	6	60
	11–20	3	30
	>20	1	10
Post-graduate courses	Master Level I	5	50
	Master of Science Nursing (MSN)	2	20
	Master Level I and MSN	1	10
	PhD, Master Level I and MSN	1	10
	None of the above	1	10

Results

Characteristics of the Participants

Thirteen nurses were enrolled in this study. Of these, seven nurses were involved in both the linguistic adaptation and content validation processes; three nurses participated only in the linguistic adaptation, leaving the study later. Therefore, three additional nurses were engaged in the content validation. In this way, both the validation and adaptation processes were conducted by 10 nurses.

The 10 linguistic-cultural adaptation nurses had the following characteristics: an average age of 39.5 years (SD = 11.7), male predominance (70%), and an average ICU work experience of 10.9 years (SD = 0.08). Regarding educational level, 80% of the respondents held postgraduate degree certifications.

For content validation, 10 experienced ICU nurses were enrolled; the sample was mainly male (60%), with a mean age of 41.5 years (SD = 10.03) and a mean work experience of 12.5 years (SD = 8.9). Ninety percent of the nurses held post-basic education degrees.

Cross-Cultural Adaptation

Comparing the T1 and T2 translations from a lexical point of view, the version of the translator with a health background had a better "clinical" correspondence with the original than the naïve translator, who admitted to finding more difficulty in rendering some technical terms. Some dissimilarities pertained to items 1, 2, 3, 7, 8, 12, 17, 18, 19, 20, and 25 in both sentence construct and choice of terms: specifically, those under consideration were "*cognitive impairment*," "reliable measuring instrument," "not effective," "atypical antipsychotic," during the day", "lethargy," and "dullness" (Table 4).

Table 4.
Comparison of T1 and T2 Version

Item	Testo Originale	T1	T2
1	Cognitive impairment reduces the risk of delirium	Il deterioramento cognitivo riduce il rischio di Delirium	Il decadimento cognitivo riduce il rischio di insorgenza del Delirium
3	Delirium causes the patient to stay in the intensive care unit (ICU) for a longer period	Il Delirium rappresenta un fattore di rischio di prolungamento del ricovero in terapia intensiva (TI)	Il Delirium prolunga il tempo di permanenza del paziente in terapia intensiva
7	The longer the duration of mechanical ventilation is, the higher the risk of developing delirium becomes	L'applicazione prolungata della ventilazione meccanica aumenta il rischio di insorgenza del Delirium	Maggiore è la durata della ventilazione meccanica, maggiore è il rischio di sviluppo di Delirium
8	Non-pharmacological approaches are not effective in the prevention of delirium	I trattamenti non farmacologici non sono efficaci nella prevenzione Delirium	I trattamenti non farmacologici non producono effetti nella prevenzione del Delirium
12	Delirium can easily be detected with a reliable measuring instrument	Il Delirium può essere facilmente diagnosticato con uno strumento di misura affidabile	Il Delirium può essere rielevato facilmente con uno strumento di misurazione efficace
17	Lethargy and dullness are symptoms specific to hypoactive delirium	Lo stato soporoso e l'apatia rappresentato sintomi specifici del Delirium Ipoattivo	Letargia e ottundimento sono sintomi specifici del Delirium di tipo Ipoattivo
18	Using three or more drugs affects the risk of developing delirium	Uno schema terapeutico costituito da tre o più farmaci influisce sul rischio di sviluppare Delirium	L'utilizzo di tre o più farmaci influisce sul rischio di sviluppare il Delirium
19	Visits to patients who have developed delirium should be restricted	Le visite da parte di familiari o conoscenti a pazienti che hanno sviluppato Delirium dovrebbero essere limitate	Le visite a pazienti affetti da Delirium andrebbero moderate
20	Agitation is observed in all types of delirium	Uno stato di agitazione può essere osservato in tutti i tipi di Delirium	L'agitazione è un sintomo presente in tutti i tipi di Delirium
25	Delirium increases the cost of patient care	Il Delirium aumenta il costo globale dell'assistenza clinica al paziente	Il Delirium aumenta i costi di degenza del paziente

The difficulty in writing the T-12 summary was to achieve syntactic and semantic convergence as close as possible to the original, since Italian is, by its very nature, more elaborate and verbose than English.

The back-translation of the T-12 produced a version that was fairly faithful to the original questionnaire. Again, two independent versions (BT1 and BT2) were chosen for writing and later merged into one document (BT-12). The BT2 translation was closer to the original than the BT1 translation, in terms of both lexical and structural choices. Some of the discrepancies found in the BT1 were attributed to the naïve translator's lack of confidence in the health lexicon. Back-translation analysis confirmed that content equivalence was maintained during the forward translation.

In drafting the Prefinal Version, both expert opinion and the advice of the author of the original instrument were taken into consideration. Where possible, to benefit the clarity and comprehensibility of the items, double negations or disjunctive conjunctions were eliminated because they are known to act as distractors in questionnaires. For some items, lexical changes were necessary for better rendering from an intelligibility and clarity point of view. Compared with the T-12 version, some changes were made: the most significant are in items 2–6–8–13–19–25: for example, the expression "superficial sedation" (item 2 of the DKT-ICN) was changed from "superficial sedation" to "light sedation." Another interesting aspect involved the wording investigating the Anglo-Saxon concept of "patient care" (item 25) translated into Italian as "clinical patient care." Following a discussion with Professor Oztürk Birge, the latter considered it appropriate to eliminate the adjective "clinical" and interpret "patient care" as a process of comprehensive care aimed at the person. For the Italian version of the DKT-ICN, the degree of agreement reached among the ten evaluators was satisfactory (Fleiss's K 81%). The final version of the DKT-ICN-ITA is provided in Appendix 1.

Results for Content Validity

In the case of the content validity of the DKT-ICN-ITA, all items achieved adequate relevance indices, with CVR scoring above the cutoff value of 0.57 (Table 5).

Regarding the items' relevance in exploring the degree of knowledge of delirium, satisfactory values were obtained both at the level of the whole scale (S-CVI/UA = 0.96; S-CVI/AVE = 0.99) and at the item level: all exceeded the cut-off of ≥ 0.78 with a score of 1, with the exception of item 11, which had an I-CVI value of 0.9 (Table 6).

Results for Face Validity

For qualitative data, responses were analyzed using a thematic content analysis approach (Thorne, 2000). Almost all experts agreed that the items were clear and accessible. In response to the question "Does the form and vocabulary adopted in writing the items make the questionnaire sufficiently clear and understandable?" Almost all (8 of 10) expressed a positive opinion. One of the experts (ID 7) suggested the deletion of "auditory and visual deficits" from item 10, believing that other conditions, such as aphasia, could also be a trigger for delirium, which was not accepted because the majority (7 out of 10) preferred to stick as closely as possible to the original version. Another expert (ID 1) commented "Indispensable tool for efficient care"; ID 6 states "Items are presented clearly and the scale, overall, appears easy to understand." ID 10 suggested a change to item 10's descriptor "sensory," to be translated as "sensory state" (change applied by the authors).

Table 5.
CVR Calculation

Calculation of CVR Experts (*n* = 10)			
	Ne	**CVR**	**Interpretation**
Item 1	10	1	Essential
Item 2	9	0.8	Essential
Item 3	10	1	Essential
Item 4	10	1	Essential
Item 5	9	0.8	Essential
Item 6	8	0.6	Essential
Item 7	8	0.6	Essential
Item 8	8	0.6	Essential
Item 9	9	0.8	Essential
Item 10	10	1	Essential
Item 11	8	0.6	Essential
Item 12	9	0.8	Essential
Item 13	9	0.8	Essential
Item 14	9	0.8	Essential
Item 15	10	1	Essential
Item 16	8	0.6	Essential
Item 17	10	1	Essential
Item 18	9	0.8	Essential
Item 19	10	1	Essential
Item 20	10	1	Essential
Item 21	10	1	Essential
Item 22	8	0.6	Essential
Item 23	10	1	Essential
Item 24	10	1	Essential
Item 25	10	1	Essential
Item 26	10	1	Essential

CVR Threshold Value >0.57.
Note: Ne = Number of experts who respondend "essential".

Discussion

Several published papers have identified ICU Delirium as an independent predictor for negative clinical care outcomes (Witlox et al., 2010), such as the increased risk of falls (Devlin et al., 2018), mechanical ventilation duration (Barr et al., 2013),

Table 6.
Calculation of I-CVI and S-CVI

Calculation of I-CVI and S-CVI Experts							
	Highly Relevant = 4	Quite Relevant=3	Somewhat Relevant = 2	Not Relevant = 1	I-CVI	S-CVI/UA	S-CVI/AVE
Item 1	10				1	0.96	0.99
Item 2	9	1			1		
Item 3	10				1		
Item 4	10				1		
Item 5	9	1			1		
Item 6	8	2			1		
Item 7	8	2			1		
Item 8	8	2			1		
Item 9	9	1			1		
Item 10	10				1		
Item 11	8	1	1		0.9		
Item 12	9	1			1		
Item 13	9	1			1		
Item 14	9	1			1		
Item 15	10				1		
Item 16	8	2			1		
Item 17	10				1		
Item 18	9	1			1		
Item 19	10				1		
Item 20	10				1		
Item 21	10				1		
Item 22	8	2			1		
Item 23	10				1		
Item 24	10				1		
Item 25	10				1		
Item 26	10				1		

Note: I-CVI = Item Content Validity Index; S-CVI = Scale Content Validity Index.

and long-term cognitive deficits (Girard et al. 2009), leading to increased lengths of stay (Devlin et al., 2018) and significantly affecting the costs of Health Boards (Vasilevskis et al. 2018). A cross-sectional survey conducted in the ICUs of a number of Korean hospitals highlighted the difficulties faced by a group of nurses in providing care to patients with delirium; lack of knowledge of the syndrome, insufficient training, and suboptimal skills were the main barriers to providing quality care (Roh, 2021).

Increasing training programs on ICU Delirium for healthcare personnel have been seen to positively affect patient outcomes (Detroyer et al., 2016), and ICU nurses' knowledge can, in fact, be considered in all respects a quality indicator as it can influence the rate of ICU Delirium assessment, prevention, and management (Aparanji et al., 2018). For this reason, the need to implement expertise regarding ICU Delirium has been repeatedly highlighted in the literature; if this does not happen, this syndrome will continue to be confused with other conditions and, at worst, not diagnosed at all (Hamdan-Mansour et al.,2010).

The DKT-ICN content was determined from literature reviews. Each item investigates the cognitive aspects of ICU Delirium, which are considered to be of fundamental importance for the nurses' cultural background; the etiology and risk factors of delirium, symptoms and subtypes, outcomes, detection, and treatment modalities are topics that find important resonance in daily clinical care, particularly in recognition and management situations, justifying the need to implement knowledge in nurses.

At present, other than DKT-ICN (Öztürk Birge, et al., 2020), no additional tools with the same purpose are available; therefore, this study aims to fill at least part of the gap of useful tools for verifying delirium skills in the ICU.

Rigorously following the methodological indications of several authors (Beaton et al., 2000; Polit et al., 2007; Terwee et al., 2007; Polit and Beck, 2006) is the strength of this study. The involvement of two translators in forward translation allowed us to avoid more bias than a single translation and enriched the process of T-12 synthesis. In fact, the use of the naïve translator allowed additional lexical nuances to be captured and the most appropriate option to be chosen. The back-translation also finds its effectiveness in involving two experts, both native speakers, who made it possible to further verify the semantic equivalence of the translation (Beaton et al., 2000).

Study Limitations

A limitation of this study is the absence of a final stage of the cultural adaptation and validation process. In fact, this study was the first step in accomplishing cultural adaptation and validation of the scale in the Italian language. The steps required to complete it are the Item Discrimination Index, Item Difficulty Index, and Cronbach's alpha for reliability, as the authors of the original instrument performed (Oztürk et al., 2020).

Conclusion and Recommendations

The DKT-ICN-ITA is a tool that tests ICU nurses' knowledge of ICU Delirium.

Defining the level of knowledge and highlighting any educational gaps can be a cue for Health Boards to hold training courses to implement Delirium skills: the level of education of nurses, in fact, not only improves the quality of care and patient outcomes but, as a result, reduces comorbidities and length of hospitalization, allowing a decrease in health care spending.

Cultural and language adaptations have made the tool available to Italian nurses. In addition, given the results obtained regarding face and content validity, the DKT-ICN-ITA is a suitable instrument for use in Italy. Further studies could offer information about tool reliability, discrimination ability, and difficulty characteristics of Italian nurses.

Data Availability Statement: : The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: CER Umbria (Date: 22.02.2024) confirms that the committee is aware of the study but has decided formal approval is not required.

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

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Appendix 1

DKT - ICN - ITA		VERO	FALSO	NON SO
1.	Il deterioramento cognitivo riduce il rischio di insorgenza del Delirium			
2.	La sedazione leggera in pazienti con ventilazione meccanica costituisce un approccio preventivo nella gestione del Delirium			
3.	Il Delirium prolunga il tempo di permanenza del paziente in terapia intensiva			
4.	L'abuso di sostanze, come alcool e fumo, aumenta il rischio di insorgenza del Delirium			
5.	Un alterato equilibrio tra neurotrasmettitori (dopamina, GABA, serotonina) rappresenta uno dei principali fattori di rischio di insorgenza del Delirium			
6.	Il trattamento farmacologico con benzodiazepine e oppioidi riduce il rischio di Delirium			
7.	L'applicazione prolungata della ventilazione meccanica aumenta il rischio di insorgenza del Delirium			
8.	I trattamenti non farmacologici sono poco efficaci nella prevenzione del Delirium			
9.	Il rischio di insorgenza del Delirium aumenta nei pazienti con ridotta mobilità			
10.	Non esiste una correlazione tra il Delirium e modifiche dello stato sensoriale del paziente (deficit uditivi e visivi)			
11.	L'aumento dei livelli sierici di Proteina C Reattiva (PCR) favorisce il rischio di insorgenza del Delirium			
12.	Il Delirium può essere facilmente rilevato con uno strumento di misura affidabile			
13.	La terapia farmacologica con antipsicotici atipici può ridurre la durata del Delirium			
14.	Il Delirium di tipo misto è una condizione in cui, durante il giorno, si manifestano i sintomi caratteristici sia del Delirium Ipoattivo che di quello Iperattivo			
15.	Il Delirium dovrebbe essere rilevato regolarmente almeno una volta a turno			
16.	Variazioni della pressione sanguigna (ipotensione/ipertensione) aumentano il rischio di insorgenza del Delirium			
17.	Letargia e apatia sono sintomi specifici del Delirium di tipo Ipoattivo			
18.	Uno schema terapeutico costituito da tre o più farmaci influisce sul rischio di insorgenza del Delirium			
19.	Le visite dei caregivers ai pazienti con Delirium dovrebbero essere limitate			
20.	L'agitazione è un segno presente in tutti i tipi di Delirium			
21.	La valutazione del Delirium da parte del personale formato richiede poco tempo			
22.	La mobilizzazione precoce rappresenta un importante intervento nella gestione del Delirium			
23.	Un trattamento efficace del Delirium di tipo Ipoattivo riduce la durata della ventilazione meccanica			
24.	Il Delirium non influenza la mortalità nelle Unità di Terapia Intensiva			
25	Il Delirium aumenta il costo dell'assistenza al paziente			
26.	La formazione e l'approccio multidisciplinare rivestono un ruolo importante nella gestione del Delirium			