Postprint: Advances in Assessment Tools for Resistiveness to Care in Dementia Patients

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Abstract

Resistance to Care (RTC) constitutes a common aberrant behavioral manifestation during the care of dementia patients, inflicting significant negative consequences on both patients and their caregivers. International research on RTC assessment instruments for dementia patients has a relatively early inception, characterized by greater depth and comprehensiveness. Since the development of the Alzheimer's Disease Resistance to Care Scale (RTC-DAT) in 1999, foreign researchers have conducted numerous revisions to its evaluation content and methodology, yielding a variety of RTC assessment instruments tailored to different care contexts. This article provides a comprehensive review of RTC assessment instruments developed abroad, focusing on examining the differences in evaluation content and methodology among various instruments, analyzing their characteristics, advantages, and limitations, aiming to provide a reference framework for developing or introducing RTC assessment instruments suitable for China's national context.

Currently, in conducting RTC-related research on dementia patients, foreign scholars primarily rely on researcher-administered observational methods based on the RTC-DAT to assess the manifestation of RTC behaviors in dementia patients; however, this approach encounters multiple challenges during practical implementation and widespread application. The Resistance to Care Informant Scale (RoCIS), developed in 2022, allows researchers to assess RTC behaviors in dementia patients through the informant-based approach commonly utilized in other fields—consulting caregivers. This offers new insights and references for introducing or developing assessment instruments suitable for evaluating RTC behaviors in Chinese dementia patients. Clinicians should select appropriate instruments to assess RTC behaviors in dementia patients based on a comprehensive consideration of the applicability of different types of assessment tools.

Full Text

Preamble

Title: Advances in Evaluation Tools for Resistiveness to Care in Patients with Dementia

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Abstract: Resistiveness to care (RTC) is a common abnormal behavioral manifestation during the care of dementia patients, causing serious negative impacts on both patients and their caregivers. Foreign research on RTC assessment tools for dementia patients started earlier and has explored relevant aspects more deeply and comprehensively. Since the Resistiveness to Care Scale for Dementia of the Alzheimer's Type (RTC-DAT) was developed in 1999, overseas researchers have made multiple revisions to its evaluation content and methods, creating distinctive RTC assessment tools for dementia patients applicable to different care settings. This article reviews RTC assessment tools developed abroad, focusing on differences in evaluation content and methods among various tools, and analyzes their characteristics, strengths, and weaknesses, aiming to provide references for developing or introducing RTC assessment tools suitable for China's national conditions. Currently, foreign scholars conducting RTC-related research in dementia patients mostly use researcher-observed methods based on RTC-DAT to evaluate RTC behavior occurrence, but this method faces numerous challenges in practical application and promotion. The Refusal of Care Informant Scale (RoCIS), developed in 2022, allows researchers to use the caregiver consultation method, which is common in other fields, to evaluate RTC behavior occurrence in dementia patients, providing new insights for introducing or developing RTC assessment tools applicable to Chinese dementia patients. Healthcare professionals should select appropriate tools to assess RTC behavior occurrence in dementia patients based on comprehensive consideration of the applicability of different types of assessment tools.

Keywords: Dementia; Resistiveness to care; Behavioral and psychological symptoms; Assessment tools; Review

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1 Overview of RTC

RTC, full name resistiveness to care/resistance to care (with "resist" as the core term), is also referred to in some literature as rejection of care, resistive behaviour, nursing care resistance, care-resistant behavior, etc., and its name has not yet been unified. LOUISE et al. [12] defined RTC as "refusing, avoiding, or otherwise preventing or disrupting hospital-provided (care services) and family caregiver-provided (social support)." Scholars from different disciplines (such as nursing, clinical medicine, dentistry, and psychology) have different understandings of RTC in dementia patients. For example, CUNNINGHAM et al. [13] and KOVACH et al. [14] from the clinical medicine field pointed out that RTC may reflect unmet needs of dementia patients, while JABLONSKI et al. [15] from the dentistry field believed that RTC behavior is a way for dementia patients to express negative emotions. The differential understanding of RTC in dementia patients and the lack of a unified, recognized definition of RTC have led researchers from different disciplines, including nursing, to often use implicit concepts to describe this behavior and use assessment tools related to these implicit concepts, such as the Agitation Behavior Scale, to measure RTC levels in dementia patients, which hinders nurses' in-depth understanding of RTC in dementia patients in practice or communication about RTC in dementia patients [16]. However, RTC and agitation are two different behavioral symptoms. Agitation may occur in any situation, including when dementia patients are alone, while RTC is a specific behavioral response of dementia patients to care activities [17]. Although there are overlaps in clinical manifestations, studies have found that they are essentially different and require different management strategies [18]. Agitation behavior is more obvious in patients with mild dementia and gradually weakens as the disease progresses, but RTC behavior continues to increase as dementia patients' conditions worsen [19].

Currently, there are approximately 40-50 million dementia patients worldwide [1]; the prevalence of dementia in China is about 7.20%, with approximately 15 million dementia patients [2]. As global population aging intensifies, the number of dementia patients worldwide is expected to reach 152 million by 2050 [3], while dementia patients in China will exceed 40 million [4]. Dementia is a progressive, irreversible neurodegenerative disease, with main clinical features including declining cognitive function, loss of personal independence, and reduced social interaction [5], and may even present with various behavioral and psychological symptoms (BPSD). Since there are still no effective methods to prevent dementia or control its progression, and both pharmacological interventions and non-pharmacological interventions aimed at improving cognitive function are difficult to achieve ideal effects, managing BPSD has become one of the key objectives in dementia patient care [6]. BPSD are common symptoms in dementia patients, including depression, apathy, anxiety, fear, agitation, and resistiveness to care (RTC). Studies have pointed out that RTC has a high incidence rate in dementia patients, causing additional distress to patients [7-8], while caregivers also experience increased discomfort, stress, and burden when

facing RTC behaviors in dementia patients [9]. Objectively and accurately assessing RTC levels in dementia patients can better understand the current status of RTC in Chinese dementia patients, explore possible influencing factors, provide references for subsequent intervention design, and help provide assistance to patients and their caregivers, reducing patient distress and various burdens on caregivers. However, there are currently few RTC-related studies on dementia patients in China, possibly for two reasons: first, researchers confuse RTC behaviors in dementia patients with agitation, restlessness, or aggressive behaviors [10], using implicit concepts to describe RTC behaviors and using assessment tools related to these implicit concepts to measure RTC levels; second, there are no specific assessment tools for RTC behaviors in dementia patients. Although some domestic researchers have begun to pay attention to RTC in dementia patients, due to the lack of specific quantitative scoring tools, they often choose to use a numerical rating scale to assess RTC in dementia patients, where caregivers select a score from 0-10 that best represents the patient's RTC level [11], which has further reduced specific research on RTC in dementia patients. Foreign research on RTC in dementia patients started earlier, with more in-depth and comprehensive research content, conducting rich studies on the concept, influencing factors, assessment tools, and interventions for RTC in dementia patients. This article focuses on introducing different types of RTC assessment tools for dementia patients developed abroad, emphasizing analysis of differences in evaluation content and methods among various tools, aiming to provide references for developing or introducing RTC assessment tools suitable for China's national conditions and to provide a foundation for subsequent related research. In October 2022, the researchers used Chinese and English search terms including "dementia/cognitive impairment/Alzheimer's disease/caregiver/resistiveness to care/resistance to care/rejection of care/resistive behaviour/agitation" to search databases including PubMed, Web of Science, and CNKI. The inclusion criteria were studies on the development and/or application of RTC assessment tools for dementia patients with original articles as the literature type, while exclusion criteria were duplicate publications, poor quality, and inability to obtain full text. After literature selection, 45 articles were included in the review.

2 Assessment Tools for RTC in Dementia Patients

2.1 Comprehensive Assessment Tools

2.1.1 Minimum Data Set (MDS) 3.0 MDS 3.0 was developed by the U.S. Centers for Medicare & Medicaid Services (CMS) and released on October 1, 2010 [20], with content updated quarterly [21], aiming to improve the comprehensive assessment process (including admission assessment and follow-up assessments) for nursing home residents mandated by the U.S. federal government through multiple mechanisms. The designers of MDS 3.0 believed that understanding patients' wishes and inviting patients with potential problems for interviews to assess their subjective states (such as pain, mood, and cognitive function) could promote "person-centered" care and improve the accuracy of

their reported subjective states [22]. Item E0800 in Section E of MDS 3.0 is an RTC behavior assessment tool that evaluates patients' RTC levels by reviewing the frequency of RTC behaviors in the past week. The scoring criteria are: 0 points for no behavior in the previous week, 1 point for behavior occurring on 1-3 days in the previous week, 2 points for behavior occurring on 4-6 days, and 3 points for daily occurrence. The current version of the RTC assessment tool in MDS 3.0 aims to determine whether patients refuse assessments and care activities necessary for residents' health and well-being (such as blood tests, medication administration, or daily living care). Researchers can combine item E0800 with other items in MDS 3.0 for application. MCCREEDY et al. [23] constructed the Agitated and Reactive Behavior Scale (ARBS) based on 4 items in Section E of MDS 3.0, which can be used to assess: (1) physical behavioral symptoms directed at others (such as hitting, kicking, pushing) (item E0200A); (2) verbal behavioral symptoms directed at others (such as threatening, screaming, or cursing) (item E0200B); (3) behavioral symptoms not directed at others (such as pacing, rummaging, undressing) (item E0200C); and (4) RTC behavioral symptoms (item E0800).

WILLIAMS et al. [21] conducted a cluster randomized controlled trial including 29 nursing staff and 27 dementia patients from nursing homes. By training nursing staff in communication skills (requiring them to change their conversational style) and reducing their use of "elder speak," they reduced RTC behaviors in dementia patients. WILLIAMS et al. [21] used item E0800 in Section E of MDS 3.0 to identify dementia patients with RTC behaviors. However, since this tool does not specify detailed types of RTC behaviors, the researchers coded RTC behaviors based on those involved in the Resistiveness to Care Scale for Dementia of the Alzheimer's Type (RTC-DAT) developed by MAHONEY et al. [24]. Since assessment based on MDS 3.0 is completed at dementia patients' admission, and WILLIAMS et al.'s [21] study lasted more than 3 months, researchers may not have used the latest version of MDS 3.0 for continuous monitoring and assessment of RTC behaviors in dementia patients during the study period. Although MDS 3.0 data have been confirmed to be valid and reliable, MDS 3.0 items reflecting state changes should receive continuous attention from researchers during study implementation [25].

2.1.2 Symptom Management at the End-of-Life in Dementia (SM-EOLD) SM-EOLD was developed by VOLICER et al. [26] in 2001, consisting of 2 dimensions and 9 items, with a Cronbach's α coefficient of 0.78. Researchers ask dementia patients' caregivers to complete the scale after inquiring about the patient's physical and psychological symptoms in the last 90 days of life. Each item uses a 6-point Likert scale with reverse scoring, where caregivers are asked to evaluate the frequency of each symptom: never = 5 points, once a month = 4 points, 2-3 days per month = 3 points, once a week = 2 points, 2-3 days per week = 1 point, and daily = 0 points. The total score is obtained by summing all items, ranging from 0 to 45 points, with higher scores indicating better symptom control in dementia patients. The sample size for scale development

was 105, with exploratory factor analysis yielding two factors: psychological symptoms (6 items) and physical symptoms (3 items). The Cronbach's α coefficients were 0.81 and 0.47 respectively. The poor Cronbach's α coefficient for the physical symptoms dimension may be due to the small number of items under this dimension and low inter-item correlation. Given the poor Cronbach's α coefficient for the physical symptoms dimension, the scale developers noted that items in this dimension could be used as independent scales. RTC-related items in the psychological symptoms dimension can be used to assess RTC in dementia patients, but these items do not specifically define or classify RTC behaviors. In KROENKE et al.'s [27] study, the Cronbach's α coefficient of SM-EOLD was 0.72, indicating acceptable internal consistency reliability.

2.1.3 Nursing Home Behavior Problem Scale (NHBPS) This scale was developed by RAY et al. [28] in 1992, consisting of 6 dimensions and 29 items. Its correlation coefficient with the Nurses' Observation Scale for Inpatient Evaluation (NOSIE) is 0.747, and with the Cohen-Mansfield Agitation Inventory (CMAI) is 0.911. The strong correlations between NHBPS and NOSIE, CMAI indicate that NHBPS is a reliable research tool for measuring behavior problems in nursing home patients. NHBPS was developed to help nursing home staff assess abnormal behaviors in nursing home residents (patients) and belongs to the caregiver-rated scale category [this study classifies scale attributes based on the type of dominant evaluator in scale development research]. The assessment can be completed quickly by nursing staff or caregivers without training, taking 3-5 minutes. Caregivers report the frequency of each abnormal behavior in patients (residents) over the past 3 days. Each item uses a 5-point Likert scale: never = 0 points, rarely = 1 point, sometimes = 2 points, often = 3 points, always = 4 points. The total score is obtained by summing all items, ranging from 0 to 116 points. RTC-related items in the uncooperative or aggressive behavior dimension can also be used to assess RTC behavior occurrence in patients (residents), but these items do not specifically define or classify RTC behaviors. Therefore, NHBPS is mostly used to assess general abnormal behavior occurrence in patients.

2.1.4 Caretaker Obstreperous-behavior Rating Assessment (COBRA) In 1992, DRACHMAN et al. [29] developed COBRA, consisting of 4 dimensions and 30 items. COBRA is a measurement tool developed to facilitate professional and family caregivers in assessing the types and severity of obstreperous behaviors in dementia patients, evaluating both frequency and severity. Frequency and severity are rated using a 5-point scale: 0-4 points for behavior occurrence from "not occurred in past 3 months" to "daily occurrence," and 0-4 points for destructive impact from "no destructive impact" to "significantly destructive impact." However, since the maximum destructiveness differs across behaviors, for physical aggression, patients can score up to 4 points on severity, while for mumbling behavior, the maximum severity score may only be 1 point. The developers evaluated COBRA's reliability using inter-rater reliability coeffi-

cients and test-retest reliability coefficients, but the sample size was small when developing COBRA, including 31 outpatients and 36 inpatients with dementia. Considering the convenience of collecting outpatient data, DRACHMAN et al. [29] conducted test-retest reliability evaluation based on outpatient dementia patient data and inter-rater reliability evaluation based on inpatient dementia patient data, making the final evaluation results somewhat limited. The item "resisting help" under the aggressive behavior dimension in this scale can be used to evaluate RTC in dementia patients.

2.2 Specific RTC Assessment Tools

2.2.1 RTC-DAT MAHONEY et al. [24] developed RTC-DAT in 1999. The scale consists of 13 items with a Cronbach's α coefficient of 0.82-0.87, demonstrating good reliability and validity. Researchers obtained permission from 3 long-term care facilities to collect research sample data and summarized common RTC behavior types through on-site observation of RTC behaviors in Alzheimer's disease patients or by recording videos for later observation. These behaviors include "turning away," "threatening," "screaming/yelling," "saying no," "pushing/pulling," "pushing away," "pulling away," "hitting/kicking," "grabbing people," "grabbing objects," "crying," "clenching mouth," and "adduction." The scale evaluates the duration and intensity of 13 behaviors [30]. Duration during a 5-minute observation period is rated using a 5-point scale: none = 0 points, <16 seconds = 1 point, 16-59 seconds = 2 points, 1-2 minutes = 3 points, >2 minutes = 4 points. Intensity during a 5-minute observation period is rated using a 3-point scale: mild = 1 point, moderate = 2 points, severe = 3 points. Researchers can assess RTC behavior occurrence in Alzheimer's disease patients through direct observation during daily living care (direct observation method) [31], or by using video equipment to record RTC behavior occurrence in Alzheimer's disease patients after obtaining caregiver consent (video observation method). Both direct and video observation times are 5 minutes. If observation time is less than 5 minutes, assessment is based on observed and recorded situations within the actual time. If observation time exceeds 5 minutes, assessment is based on situations observed and recorded within the first 5 minutes. The observation time was set at 5 minutes because the developers considered this to be the average time required to complete the shortest daily living activity: using the toilet. To assess the severity of RTC in Alzheimer's disease patients, the duration score and intensity score for each item are multiplied to obtain the final item score, and all item scores are summed to obtain the total scale score, ranging from 0 to 156 points, with higher scores indicating more severe RTC. As Alzheimer's disease patients' conditions progress, their RTC-DAT scores continuously increase until reaching the lowest point only at the end-stage of the disease [24]. This scale is the first specific RTC behavior assessment scale and the first researcher-rated scale in the RTC field (the users of researcher-rated scales are not limited to researchers). It provides detailed distinction and definition of common RTC behaviors, but both direct observation and video recording methods have high

implementation costs, which somewhat hinders large-scale promotion and use of this tool.

2.2.2 Resistiveness to Care Scale-Revised (RTC-r) Some studies have pointed out that dementia patients are more likely to experience RTC during oral care [32-33], but using RTC-DAT during oral care has many inconveniences. To address this issue, JABLONSKI-JAUDON et al. [34] revised RTC-DAT in 2016 and verified the reliability of applying RTC-r to assess RTC behaviors in dementia patients during other care activities. Since real-time recording of the duration of each RTC behavior during oral care is difficult, JABLONSKI-JAUDON et al. [34] did not include behavior duration in the evaluation content, requiring users only to evaluate the frequency and intensity of behaviors corresponding to each item. The total score is calculated by multiplying the frequency of each behavior by its intensity score and then summing all items, so RTC-r has no upper limit. The more RTC behaviors occur, the higher the total score, with higher scores indicating more severe RTC. JABLONSKI-JAUDON et al. [34] believed that using Cronbach's α coefficient to measure the internal consistency reliability and reliability of RTC-r was not the best choice, because individual items do not make absolute contributions to the overall RTC-r (meaning that dementia patients showing one type of behavior do not necessarily show the other 12 types), and parallel validity is the best indicator for measuring RTC-r reliability [34]. RTC-r provides new tools and ideas for nursing staff to effectively assess RTC behavior occurrence in dementia patients under special circumstances, but not including behavior duration in the evaluation content may result in evaluation results that cannot truly reflect RTC situations. In clinical work, nursing staff should select appropriate assessment scales based on the usage environment, trying to ensure that as much original information as possible is retained. RTC-r is a researcher-rated scale (in the RTC-r development study, researchers observed dementia patients' RTC when nursing staff provided oral care), but for nursing staff, accurately and timely recording RTC situations during independent oral care is not simple. Nursing staff, limited by their personal abilities, often find it difficult to record in real-time, which may be even more difficult for family caregivers lacking care knowledge and research literacy. Currently, no domestic scholars have translated and applied this scale.

2.2.3 Resistiveness to Care Scale for Cognitively Impaired Older Adults In 2017, GALIK et al. [35] revised the evaluation content and application scope of RTC-DAT and developed the Resistiveness to Care Scale for Cognitively Impaired Older Adults to identify dementia patients with RTC. The scale's Cronbach's α coefficient is 0.84. To complete Rasch analysis, GALIK et al. [35] did not include behavior intensity in the evaluation content and modified the duration evaluation method: if researchers observed behaviors belonging to the 13 RTC behaviors during care activities, the corresponding item was rated as "yes" and scored 1 point; otherwise, the item was rated as "no" and scored 0 points. If the same behavior occurred multiple times,

the frequency was recorded after the corresponding item. The final item score was obtained by multiplying the duration score by the frequency of the behavior, and all item scores were summed to obtain the total scale score [36]. Therefore, the maximum score of the scale is not fixed. In GALIK et al.'s [35] study, the highest score of subjects on the Resistiveness to Care Scale for Cognitively Impaired Older Adults was 17 points. Using data from 261 dementia patients from 9 nursing homes, GALIK et al. [35] conducted reliability and validity testing of the scale, proving that its applicable population could be expanded from Alzheimer's disease patients to all dementia patients (including Alzheimer's disease, vascular dementia, mixed dementia, and other types). The Resistiveness to Care Scale for Cognitively Impaired Older Adults has been proven applicable for assessing RTC behaviors in nursing home dementia patients [37-38].

GALIK et al. [35] revised the evaluation method for RTC behavior duration, making assessment work simpler and the tool more convenient to use, but the retained original information was also reduced. "Yes" and "no" can only reflect whether dementia patients have RTC, while the frequency of RTC behaviors is insufficient to reflect their intensity. Considering that both frequency and intensity are key factors affecting RTC behavior severity, the total score measured by the Resistiveness to Care Scale for Cognitively Impaired Older Adults may not accurately reflect the severity of RTC behaviors. This scale is a researcher-rated scale that still follows the assessment method of RTC-DAT—researchers conduct direct observation of dementia patients during daily care work, with observation time still set at 5 minutes, which may cause some RTC behaviors that easily appear at specific time periods to be missed. Conducting multiple observations of the same patient at different time periods and making further adjustments to the scoring method can improve the accuracy of assessment results.

2.2.4 Refusal of Care Informant Scale (RoCIS) RoCIS was developed by BACKHOUSE et al. [39] in 2022 based on RTC-DAT and can be used to assess RTC in advanced dementia patients. The scale initially contained 14 items: "moving away," "pushing caregiver away," "pushing care equipment away," "pulling items," "grabbing items," "grabbing caregiver," "making body stiff," "aggressive behavior," "verbal refusal," "restlessness," "aggressive language," "clenching mouth," "no response," and "physical non-cooperation." However, after completing Rasch analysis, BACKHOUSE et al. [39] deleted the "restlessness" item. The final version of RoCIS is a one-dimensional scale with 13 items. Each item is evaluated as yes/no based on whether the corresponding behavior occurred in the previous month, with "yes" scored as 1 point and "no" as 0 points. The sum of all item scores is the total scale score, ranging from 0 to 13 points. RoCIS has a Cronbach's α coefficient of 0.88 and good correlation with CMAI ($r=0.55$, $P<0.01$).

RoCIS belongs to the caregiver-rated scale category. When using RoCIS to as-

sess RTC behavior occurrence in dementia patients, the required information is mostly provided by primary caregivers who can offer detailed, personalized information about patients. The accuracy of assessment results often depends on caregivers' understanding of RTC behaviors. When there is a large discrepancy between primary caregivers' and researchers' identification of RTC behaviors, especially when primary caregivers consider RTC as normal reactions or problems that can be solved and thus ignore them, the total RoCIS score for dementia patients will be low. Nevertheless, RoCIS is the first caregiver-rated specific RTC behavior assessment scale. Compared with evaluating RTC behavior occurrence through on-site assessment or video recording, this tool enables evaluators to complete assessment work quickly, saving time, energy, and expenses, and is cost-effective. Currently, the initial development of RoCIS has been completed, but no researchers have applied RoCIS in studies yet.

3 Evaluation and Recommendations for RTC Assessment Tools in Dementia Patients

Since dementia patients cannot clearly convey their needs verbally, their daily care work is full of challenges. Accurately understanding and assessing patients' needs is key to successfully managing abnormal symptoms. Dementia patients in the early stages of the disease have relatively intact cognitive functions, and self-report scales can be considered for measuring some psychological symptoms depending on patient conditions. However, it is worth noting that the emergence of behavioral symptoms often indicates severe cognitive impairment in dementia patients. For example, RTC behavior is more common in patients with moderate to severe dementia [24], so when behavioral symptoms appear, other-rated scales are mostly selected. Comprehensive dementia patient abnormal behavior assessment tools were the earliest developed tools that can be used to assess RTC in dementia patients, but RTC is mostly one evaluation item or one dimension of these scales, so they rarely define and classify RTC behaviors in detail. Although comprehensive dementia patient abnormal behavior assessment tools are not currently mainstream RTC behavior assessment tools, they can still provide references for researchers developing tools suitable for China's national conditions. Comprehensive dementia patient abnormal behavior assessment tools [20,26,28-29] are all caregiver-rated scales using Likert scoring methods. Caregiver-dominated assessments are mostly retrospective assessments, which is a commonly chosen evaluation method when researchers develop assessment tools for dementia patients, possibly because caregivers are individuals who have direct contact with patients, live with them, and know their personal preferences and behavioral manifestations best [40]. MDS 3.0 has comprehensive items, and its allowance for researchers to construct new tools through combination greatly improves tool applicability and flexibility. Quarterly updates help ensure the scale's advancement [20], and its development and use can provide references for China to build a systematic dementia patient assessment system.

Specific dementia patient RTC behavior assessment tools are currently mainstream tools for assessing RTC behaviors in dementia patients. Evaluators can be researchers [24,34-35] or caregivers [39], and assessment methods can be observational assessment (direct observation and video recording) [24,34-35] or retrospective assessment [39]. Researcher-conducted assessments are objective evaluator assessments, with the main characteristic being that researchers observe dementia patients' RTC situations during care work through direct observation or video recording. RTC-DAT [24] is the first researcher-rated specific dementia patient RTC behavior assessment scale. Results obtained through researcher observation and measurement may better reflect real situations, especially when researchers have received relevant training and have clear understanding of RTC behaviors. However, this approach inevitably consumes considerable researcher time and energy, generates significant costs, and may even require researchers to secure additional funding support, which is why researcher-rated specific dementia patient RTC behavior assessment scales have not been widely promoted and used. Under China's special national condition where dementia patient care relies on family members [41-42], the possibility of large-scale promotion and use of researcher-rated specific dementia patient RTC behavior assessment scales is also low. Additionally, whether researchers observe directly or through video recording, it is difficult to avoid the Hawthorne effect [21] (the phenomenon where subjects produce positive responses to experiments or tests, i.e., changing behavior due to environmental changes [the observer's presence], ultimately altering experimental or test results). When using researcher-rated specific dementia patient RTC behavior assessment scales, the presence of researchers/video recording equipment causes environmental changes that may potentially affect both the observed dementia patients and/or nursing staff. RTC occurrence is related to three factors—patients, caregivers, and environment—and the implementation of this method may affect the rise and fall of these factors, ultimately causing measurement bias. The setting of observation time may also affect RTC behavior measurement. RTC-DAT sets observation time at 5 minutes, but situations observed within 5 minutes are insufficient to represent patients' daily or periodic situations. Moreover, dementia patients' RTC behaviors may appear at specific time periods or have triggering factors. Failure to observe at specific time periods and conditions may make it difficult to record real situations, resulting in lower scale scores for dementia patients. To address the shortcomings in observation time setting, researchers have proposed different solutions. In RESNICK et al.'s [43-44] studies, observation time (based on RTC-DAT) was set at 15-30 minutes, and the number of behavior occurrences was considered in the analysis. SHAW et al. [45] scored based on the percentage of time mapped to the original measurement scale: 0 points for none, 1 point for <5.00%, 2 points for 5.00%-<20.00%, 3 points for 20.00%-40.00%, and 4 points for >40.00%. When using researcher-rated specific dementia patient RTC behavior assessment scales: (1) researchers can communicate fully with caregivers to understand dementia patients' specific personal information and conduct multiple, longer observations during time periods when dementia patients are prone to RTC behaviors; (2) scoring based on the percentage of time

mapped to the original measurement scale can effectively improve assessment result accuracy; (3) to maintain balance between research work and economic benefits, researchers still need to secure adequate funding support.

The accuracy of assessment results for caregiver-rated specific dementia patient RTC behavior assessment tools mostly depends on caregivers' own understanding of RTC behaviors, which requires researchers to help caregivers clarify the concept of RTC. When using caregiver-rated specific dementia patient RTC behavior assessment tools, caregivers often need to recall behaviors that occurred in dementia patients over a past period. Caregivers may accurately recall more severe, typical RTC behaviors that have greater impact on them, but may not accurately recall behaviors with milder severity or those they consider manageable, ultimately resulting in measured scores lower than actual levels. The development of RoCIS provides new ideas for RTC behavior measurement: researchers can pre-explain the connotation of each RTC behavior type to caregivers and methods for distinguishing RTC from other behaviors and psychiatric symptoms to improve the reliability of caregiver-reported results and thus improve measurement reliability. In the future, researchers can compare RTC behavior levels in dementia patients under observational and retrospective assessment methods, analyze the correlation and differences in RTC behavior occurrence under different scales, and make recommendations for scale type selection in different contexts, which has guiding significance for constructing the RTC assessment tool system for dementia patients.

4 Implications and Outlook

This article introduces RTC assessment tools for dementia patients abroad, focusing on analyzing differences in evaluation content and methods among different tools. RTC assessment tools for dementia patients have evolved from one item in early comprehensive dementia patient abnormal behavior assessment tools to independent scales, depending on researchers' more comprehensive understanding of RTC behaviors, increasing attention to RTC behaviors, and the joint efforts of researchers. Currently, there are few RTC-related studies on dementia patients in China, and China's dementia patient RTC field needs more researchers' attention, urgently requiring in-depth exploration of RTC situations in Chinese dementia patients. Since RTC-DAT was developed, foreign researchers have made multiple revisions to evaluation content and methods to more accurately and effectively assess RTC behavior occurrence in dementia patients, providing new references for domestic scholars to develop dementia patient RTC assessment scales. When domestic scholars develop dementia patient RTC assessment scales, they should actively learn from the advantages of each scale. The use of observational assessment methods may help explore the real-time impact of intervention methods on RTC in dementia patients, while retrospective assessment methods may be beneficial for evaluating RTC occurrence over a certain period. Researcher-rated and caregiver-rated specific RTC behavior assessment tools each have advantages, but currently there are no stud-

ies on the reliability and applicability of these two types of tools. Subsequent researchers should introduce or develop tools applicable to RTC assessment for Chinese dementia patients based on fully considering their advantages and disadvantages and combining China's special national conditions.

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